



Journal of the Irish Dental Association

Iris Cumainn Déadach na hÉireann

Body of Evidence

Ireland's State Pathologist, Professor Marie Cassidy, explains how we can help identify both victim and attacker.



Headaches
Diagnosis and treatment



Provisional Crown
A review



What's your diagnosis?
Win a voucher for Brown Thomas



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The Journal of the Irish Dental Association

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Vacancies in the Office of Chief Dental Officer

Many of you will be aware that the post of Chief Dental Officer has remained vacant for the past six months despite numerous requests from various organisations (including the IDA) to have the post filled as a matter of urgency. The Chief Dental Officer is the primary dental advisor to government in relation to dental matters in Ireland.

Given the seriousness of this situation, I contacted the Department of Health and Children (the Department) and was advised as follows (in italics):

- *The position is vacant and the question of filling the post is being considered in light of a number of developments within the service, including the establishment of the Health Services Executive. The Health Service Executive (HSE), established by this Government, is the governing body charged with the responsibility to provide all of the state health services in Ireland.*
- In response to my question on who was advising the Department on dental health pending the appointment of a Chief Dental Officer, I was informed that: *The Minister, Department and other health service bodies have available to them a number of sources and experts who are in a position to provide expert advice as required. Dr Margaret Shannon (formerly Assistant Chief Dental Officer) has been seconded to the Department from the South Western Area Health Board to act as a dental advisor to the Department. The Department did not identify who these sources and experts are.*
- I highlighted to the Department that I had been seeking clarification on the very serious and highly controversial issue of the legality of tooth whitening products since April last, and that, to date, nobody has responded to the request to convene a meeting with the Irish Dental Association and Dental Protection. The Department replied that it has *responded the IDA in response to the*

tooth whitening issue and that the Cosmetics Directive is a matter which is being dealt with by the Department's Chief Pharmacist. The IDA has confirmed that it has not been contacted by the Department's Chief Pharmacist and that the issue of tooth whitening has not been addressed by the Department. This leaves the Irish dental profession in a very vulnerable and frankly totally unacceptable position on the legality of tooth whitening products in Ireland.

- The Department refused to respond to whether it has ever been without a Chief Medical Officer.

So, at present, we do not have a Chief Dental Officer or an Assistant Chief Dental Officer. Without an advisor to Government, can we be sure that dentistry will not be sidelined as a result in the restructuring of the health care service? Can we afford to wait and see?

It is critical that we get the message to the public that we find this a matter of grave concern and one that will seriously limit our ability to optimise dental services in Ireland.

In the meantime, I wish you a safe and happy Christmas and thank all of you who have contributed to the Journal this past year.



Aisling O'Mahony
Editor

On-line postgraduate degree programme in clinical dentistry launched

King's College London has launched the world's first on-line postgraduate degree programme in Clinical Dentistry (Prosthodontics).

The M.Clin.Dent (Prosthodontics), as it is formally known, is to be offered through the University of London's distance study programme, the External Programme.

The on-line programme (the e-MClinDent) was demonstrated at the College's 175th anniversary celebrations, which were held recently in London. Also on display at the celebrations were the latest intra-oral cameras and video-conferencing - a process that involves placing a miniature camera inside a patient's mouth at a remote practice so students can remotely view the dentist's work.

Association seeks to discuss disclosure of GMS earnings

A meeting has been sought with representatives of the Department of Health and Children following a number of IDA members contacting the Association to express their concerns over the manner in which information relating to their earnings under the Dental Treatment Services Scheme was being distributed to the media under the Freedom of Information Act, 1997.

The main concern expressed relates to the personal safety of dental surgeons and their staff following a serious violent assault that occurred in the southeast on a general medical practitioner after disclosure of his earning from the GMS.

Whilst the Association accepts that the Department has no control over the 'spin' the media may place on the release of such figures, the IDA believes it would be prudent of the Department of Health and Children to release this information in a manner that sets out the context of the payments to dentists, for example, that they are gross payments, that the dentist may have a number of associates operating on his or her panel number, etc.

Dental Council examination

The Dental Council examination for foreign trained dentists, held in two parts in April and June 2004, resulted in 11 candidates out of a total of 21 being successful and qualifying for full registration in the Register of

Dentists. The country of origin of successful candidates was as follows:

Nigeria	3
India	3
Bulgaria	1
Sudan	1
USA	1
Libya	1
Lebanon	1

Dental hygienists and the law

The Dental Council has received information that in some practices, patients are being assigned to the dental hygienist for charting and cleaning before attending the dentist. This is illegal, is in breach of Council guidelines and leaves both the dentist and the dental

Register of Dentists

The registration in Ireland of dentists from the new EU accession states that became full members of the European Union on May 1, 2004 has been as follows:



Associate and hygienist contract guidelines finalised

The IDA sub-committee, which was established by Council to draft guidelines for contracts relating to dental associates and dental hygienists, has presented the guidelines to the Executive Committee at its October meeting. The guidelines were passed unanimously.

Dr Michael Galvin, IDA President, thanked the sub committee for all its efforts in preparing these guidelines in such a timely and efficient manner.

Members can avail of the new guidelines by accessing the members section of the IDA website - www.dentist.ie. Alternatively, members can contact the Association at 01-2830499 for a copy to be emailed, faxed or posted.

Cork doctor receives award



The Pierre Fauchard Academy recently awarded its International Certificate of Merit to Dr Robin O'Sullivan, Senior Lecturer in Anatomy at University College Cork, in recognition of his contribution to dental education and its assessment, and his tireless encouragement and mentoring of undergraduate and postgraduate dental students. The Pierre Fauchard Academy is an international dental honour organisation. It was founded in 1936 to commemorate Pierre Fauchard, who is credited with being the father of modern dentistry. The International Certificate of Merit is awarded on an occasional basis to individuals who have made an exceptional contribution to dentistry.

hygienist open to a charge of professional misconduct.

A dental hygienist is permitted to carry out certain dental work under the supervision of a registered dentist when the dentist has first examined the patient and indicated to the dental hygienist the course of treatment to be provided.

GMS (Payments) Board accepts new claim forms

Following discussion with the Irish Dental Association and the GMS (Payments) Board, it has been agreed to offer all dental contractors the opportunity to submit their monthly claims using a computerised self-printed form.

The GMS (Payments) Board is prepared to accept this form for processing, provided it conforms to the standards agreed, and that the Board receives prior written notification regarding the submission of such forms from each dental contractor. A sample of the self-printed 'D Form' should accompany the letter of notification to the Board.

The procedures in relation to the claiming and processing of such

forms are as follows:

- Dentist must submit two exact copies of the form per claim to the Health Board.
- Details must be identical on both forms including the form number.
- The Health Board must sign and stamp both copies, again ensuring both copies are identical, before returning forms to the claiming dentist.
- The dentist will submit one copy to the GMS (Payments) Board for payment.
- The dentist must retain second approved copy securely, for a period no less than five years

If you require any further information contact the Boards' Dental Unit at 01-8641996.

XLCR user group

Are you an XLCR user with a current contract with Schein Technologies? Are you interested in being part of a user group to

improve the product? If so, please send an e-mail to xlcr_user@google.com with your name, address and contact phone number.

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• Proven efficacy in the treatment of dental pain.^{1,2}

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Review of the Dental Treatment Benefit Scheme

The Irish Dental Association has now circulated all branches with a copy of the DSFA/IDA Review of the Dental Treatment Benefit Scheme which was undertaken following settlement of the lengthy dispute between the Association and the Government during 2002/03.

The Review was useful in identifying issues which the negotiating team wished to progress and gave new members of the team an insight into the areas where difficulties remained within the contract.

Some important outcomes need to be highlighted. Firstly the agreement that the contract is amended to facilitate dental

hygienists undertaking appropriate treatments on behalf of participating panel dental surgeons, i.e. protracted periodontal treatments.

Secondly, both parties re-affirmed their commitment to paragraph 20 of the 1992 Agreement – which commits the annual review of professional fees to take cognisance of 'dental practice costs and dental procedures generally' as well as CPI etc. In that context, both parties agreed to enter 'immediate negotiations' on the formula for annual increases. The IDA Negotiating Team is currently compiling research in relation to dental costs and associated inflation over the past 5 years.

Also, when dealing with dentures the report, (which is agreed by both sides) re-affirmed the paragraph 24 of the 1992 contract – '...the contracting dentist shall be entitled to draw up and offer to the qualified person, an alternative form of treatment which will provide that person with a degree of choice in regard to the level and standard of treatment provided'. In these circumstances, the dentist may agree the appropriate additional fee with the patient.

Copies of the Report are available on the members section of the IDA website – www.dentist.ie and is attached as an appendix to the Annual Report 2004.

UK looks to Europe to address shortfall in dentists

Following the Annual Meeting recently of the Association of Dental Education in Europe (ADEE) at Cardiff University's Dental School, Professor Malcolm Jones, Dean of the Dental School said that the college is looking at establishing and applying common and uniform teaching standards across the EU. "This is particularly important at the moment when the UK is looking to recruit dentists in Europe to address the shortfall in numbers of dentists."

RCSI 2005 Annual Scientific Conference

The Faculty of Dentistry, the Royal College of Surgeons in Ireland, has announced details of its 2005 Annual Scientific Conference. Under the theme, Oral Cancer – The Patient's Journey, the conference will take place over two days from October 27, 2005, at the RCSI in Dublin.

The aims and objectives of the meeting include:

1. Information exchange for primary, secondary, tertiary and professionals complimentary to medicine/dentistry;
2. The roll of primary carers in diagnosis, prevention, intra- and post-operative care;
3. Improved knowledge of cancer care pathways thus improving supportive capabilities; and,
4. Insight into the physiological aspects of care of oral cancer patients.

The keynote speaker will be Prof John Beumer III, DDS, MS, and other speakers will be confirmed shortly. Further information will be available on the Faculty of Dentistry's section of the RCSI website – www.rcsi.ie or by Telephone: 01-4022239.

Endodontic patient information leaflet launched



At the launch of the Endodontic patient information leaflet are: Dr Johanna Glennon, President of the Irish Endodontic Society; Dr Garry Heavey, President of the Dental Council; and, Dr Maggie Shannon, from the Department of Health.

Access to dental records

Under Section 4 of the Data Protection Acts 1988 and 2003, a person has a right to obtain a copy of any information relating to him/her that is kept on a computer or in a manual filing system by any other person or organisation.

This legislation impacts on the practice of dentistry in that patients now have a statutory right to obtain a copy of their dental record and a right to have any information contained in the record fully explained.

A dentist can require the patient to make a formal written request for a copy of his/her record and may charge a fee, which can not exceed €6.35. Once a written request has been received and the fee paid, the dentist has a maximum of 40 days in which to comply.

With regard to a patient's radiographs, the dentist must provide a written summary of what a radiograph indicates but is not required to provide a copy of the radiograph itself. However, if a copy radiograph is provided the dentist is entitled to recoup from the patient the cost of copying and any associated costs.

Irish Dental Association Annual Scientific Conference 2005



Dr Pat Cleary, Vice President, Irish Dental Association, and Chairman of the Annual Scientific Conference Committee.

Next year, the 82nd Annual Scientific Conference of the Irish Dental Association returns to Killarney and the elegantly refurbished Great Southern Hotel.

The title of the conference, which takes place from Thursday April 14 to Saturday April 16, 2005, is 'Peak Performance' as befits the location and the Killarney crest is incorporated into the conference logo.

As usual, a comprehensive programme of scientific and social events has been organised, with internationally renowned speakers such as Dr Derek Setchell, Dr Walter de Vota and Dr Martin Trope along with some of our own well-known Irish speakers.

The pre-conference courses, which will take place on Thursday April 14, cover the areas of practice management, paediatric dentistry, treatment planning and implants. These courses will commence at 8.00am and will end at 12.30pm. It is hoped that this will facilitate a more social beginning to the conference, with golf and other activities planned for the afternoon.

- There is a programme to suit the entire dental team
- Pre-conference courses will take place on Thursday April 14
- An extensive series of lectures will take place on the Friday and Saturday
- There will be table demonstrations and poster exhibits on the Friday
- A dental trade exhibition will be held on both the Friday and the Saturday
- There is an extensive social programme, which includes golf at Lackabane with a shotgun start at 2.15pm on the Thursday and a gala dinner dance on the Saturday.

Social events

The social programme includes a welcome reception in the Hotel on Friday April 15. As usual golf competitions have been organised. This year there is a change in format as the President's Prize will be on Thursday afternoon, with a 2.15pm shotgun start. It will not be possible to accommodate more than 70 golfers for this event so early booking is essential. We ask all participating golfers to assist in this. A golf competition for non IDA members has been arranged for Mahony's Point at Killarney Golf Club on Friday morning. All accompanying persons are welcome to enter this competition.

On the Saturday morning, there will be a charity fun run. Everyone is encouraged to enter this event and hopefully raise much needed funds for a local charity.

The conference concludes on the Saturday night with the President's Gala Dinner Dance. All delegates at the conference are invited to book for this event and may invite friends and guests. Formal dress is not required. We are confident that this evening will be an enjoyable and social end to the conference.

Your room awaits...



The Great Southern Hotel has been extensively refurbished and now has a conference centre par excellence. It has a beautiful spa and leisure centre to help unwind after absorbing all that scientific information and also has excellent dining facilities.

The hotel is conveniently located in the heart of Killarney, adjacent to both bus and train stations, within walking distance of the town centre. For accommodation purposes, early booking with the hotel is advised to avoid disappointment.

Dental nurses

As in previous years, dental nurses have a dedicated programme on Friday 15. It is worth noting that all people registered for the conference: dentists, hygienists, technicians and dental nurses are invited to attend any or all of the presentations and social events during the conference.

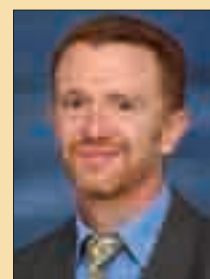
Trade show

The IDA Annual Scientific Conference is the largest dental meeting of the year and has a trade show to match. We appreciate input from the various companies to the conference, especially our conference partners, NobelBiocare, Colgate, GSK, AIB, Ankylos and Wrigleys, and also from all members of the dental community who exhibit during the trade show and who sponsor additional events and items during the conference.

Further information on the conference can be obtained from: Ms Joan Bracken, Conference Secretary, Irish Dental Association, 10 Richview Office Park, Clonskeagh, Dublin 14
Tel: 01-2830499 Fax: 01-2830515

Or check out the IDA web site at www.dentist.ie

We hope to see as many people as possible in Killarney, for what we are sure will be both an enjoyable and educational experience.



*Gerry McCarthy,
President-Elect IDA*

BSPD conference takes place in Belfast



Pictured from left to right are Dr Borghild Breistein, Dental Services Manager for North and West Belfast Trust; Alan McCartney, GlaxoSmithKline; Dr Pauline Carson, Dental Services Manager for Bangor and Ards Trust; and Mr Brian Gamble, Community Dental Officer with Bangor and Ards Trust.

The British Society for Paediatric Dentistry (BSPD) Conference took place in Belfast recently. The event was attended by over 250 paediatric dental experts from all over the UK and Ireland, plus community and general dental practice personnel.

2005 Innovation in Oral Care awards

The International Association for Dental Research and GlaxoSmithKline Consumer Healthcare have announced the 2005 Innovation in Oral Care awards. Competitive awards of up to US \$75,000 will be awarded to recipients who advance oral care programmes directed toward the development of innovative and novel compounds, biomaterials or devices that can be used ultimately at the public health level.

Further information can be found at www.dentalresearch.org.

Website promotion

A new waiting room poster is available free of charge for members of Wrigley Oral Healthcare in Action (OHA). The poster has been developed to communicate with patients of all kinds and directs them to a new oral care website: www.BetterOralHealth.info.

The website is designed to answer patient queries in an appealing, easy to read format. The information provided varies from advice on avoiding problems such as plaque and gum disease, to ideas on healthy snacks and tips on calming fears of visiting the dentist. In addition, plans are already in place to introduce a children's section later this year.

The website also has a section for the dental profession, which contains everything from clinical abstracts and articles, to advice on motivating patients. The posters are available from Wrigley Oral Healthcare in Action on 1800-413100.

Colgate appointment



Grainne Teefy has joined Colgate Ireland as a Dental Detailer. Grainne has a strong dental background having qualified as a dental nurse from the Dublin Dental Hospital and has also worked in the dental sales area. Grainne will be responsible for visiting dental practices nationwide and will be detailing Colgate's oral care brands.

Techceram to promote 3M ESPE

Techceram has announced that it will promote and distribute 3M ESPE Rocatec, Co-jet and Sinfony composite products.

Helping win the flossing battle



The new Reach Access daily flosser.

Johnson and Johnson has launched its new Reach Access daily flosser in an attempt to get people to floss daily. The company says its research revealed that 83 per cent of consumers said they would become daily flossers after trying the product.

Teeth that reveal the secrets of the dead

Badly decomposed bodies, victims of horrific murders and unidentified corpses are all part of a working week for Professor Marie Cassidy, Ireland's only State Pathologist. Almost a year after taking up her position, this most unusual of civil servants talks to DANIEL ATTWOOD about her fascinating role at the heart of the Irish forensic service and about the unique way the dental profession can help her identify both victim and attacker.



Professor Marie Cassidy, Ireland's State Pathologist, investigates a recent case.

Professor Cassidy, who is better known to millions of RTE news viewers as State Pathologist, Marie Cassidy, came to Ireland as the Deputy State Pathologist in 1998. In her now famous trait for saying what she means in a blunt but humorous manner (she once told the people of Limerick that their nickname of "stab city" was deserved), Marie reveals that she always intended to have Ireland's top forensic position. "When I took the job as deputy, I said I was only coming over on the basis that I was going to be the State Pathologist, otherwise I wasn't bothering. I made it quite clear that that was my intention from the start." Following the retirement of the then State Pathologist, Professor John Harbison, she got her wish in January 2004.

But despite her obvious enthusiasm for the job and determination to be Ireland's State Pathologist, forensic pathology has not been her life's ambition. "Back in 1985, nobody wanted forensic pathology as a career, and I

didn't either." But after working for only a few weeks in this specialist area in Glasgow, she was hooked. "I just loved it and they had a post that they had been looking to fill for years because nobody wanted to do this job in Glasgow, and once I started I thought: 'wow this is really fascinating'. I wouldn't do anything else now."

But the role is a demanding one, and the situation that has been made increasingly desperate because no replacement deputy has been employed. However, this is all about to change. On November 18, Marie will finally get a deputy and be able to share her substantial workload. Until now she has been on-call permanently, although a pathologist in Cork and another in the midlands have been taking some of the work, especially at weekends. "November 18 is D-Day for me. Michael Curtis will become the new Deputy State Pathologist," explains Marie with a relieved smile. "He is currently the assistant state pathologist in the north, so really I have poached one of their boys," she says without a glimmer of guilt at leaving the Northern Irish pathology service short.

But Marie, and her family – she is married with two teenage children – have been coping with what has been in effect her 24-hour-a-day job since Harbison's retirement. "It is a pain in the ass! It demands so much of your time... it becomes all consuming, you can never get away from it and it becomes the focus of your life," she explains. "The problem is it affects the whole family. It is not just affecting me being up and down the country and coming in at all strange hours, it has a knock on effect on the whole family... I can't make any commitment to them and I try and do everything and juggle like mad saying 'yes of course I'll be there' and then I get the call that a body's been found."

cover story



Even this badly decomposed body with just a few teeth remaining was identified from dental records.



Ante-mortem x-rays are an invaluable source of irrefutable evidence of a body's identity when compared with post-mortem x-rays such as these.

The forensic pathology department's workload is increasing as more cases that were heretofore dealt with by hospital pathology labs are sent to Marie. "We are all under more pressure now," she says. "The knock on effect is that we are getting more and more work coming through our doors. But that's no bad thing; these are often the interesting cases that make you think long and hard. If you somebody comes in with 40 stab wounds, all you have to be able to do is count. It's the other, more interesting cases that I like."

Teeth that continue to talk

One of the most fascinating aspects of Professor Cassidy's work is the identification of unknown corpses, and it is here the dentistry plays a vital role. "In identification, forensic dentistry is invaluable because we deal with a lot of decomposed bodies and bodies that are badly traumatised. This means we can't do the normal facial identification, which happens in 99 per cent of cases, where somebody comes in and says: 'yes that's my mammy or that's my daddy'," explains Marie. Paul Keogh is Ireland's forensic dentist. "Normally what would happen is that the Paul would come in and chart the teeth of the deceased. We would then seek to find records."

In the majority of cases, Marie and her team would already have a suspicion of the identity from evidence such as where he or she was discovered, papers and ID found on the body or because they fit a missing person's identification "So in the majority of cases we already have an idea of who we are dealing with. Therefore, we can go and find the dental records relating to that person and then the forensic dentist can check and make a positive identification."

The importance, therefore of dentists keeping accurate, up-to-date and easily accessible records is apparent. "If you have x-rays then that is a bonus," explains Marie. "Because if you can get a physical match between the ante-mortem x-ray and the post-mortem x-ray of that mouth, then that's very good evidence."

There is a small percentage of cases however where Marie is dealing with a complete unknown and it is these cases that often involve a long search. "In these cases, the deceased teeth are charted and in some cases x-rays taken under Paul's direction and that information will then be retained until such time as we have a potential identity," explains the pathologist. "There is no way to search through records; there's no one big machine that gives you 10 names after you put in this information. It is not like fingerprints."

There is an assumption, even among those that should know better, that dental records are exactly like fingerprint records. "In Glasgow, the procurator fiscal assumed that there was this big machine somewhere that if you typed in 'he had the second upper left missing, etc' all of

sudden it would come out with 'there's 20 people in Scotland like that'. Dream on! It's just not like that," says Marie. "If you're lucky we will go into some dentist and he will go scrambling through his records and go there you go that's him, I gave him a filling 10 years ago."

In cases where there is no idea of who the deceased is, the details are left on file. "Sometimes it can be that we use dental records to build up a profile of somebody and hope that at sometime in the future that person will be positively identified."

In evidence

The other role of dentistry in forensic science — that of identifying attackers from the bite marks on their victims — is as fascinating. "Bite marks are usually in the sex-related crimes, so we're talking about rape homicides and sometimes homosexual murders as well."

When a victim's body is brought to Marie, she will look for marks on the body. "Anything at all that has any hallmarks to it that might suggest that it could be a bite mark, then I always called in the forensic dentist," she explains. "He will build up a profile of the mouth from the bite and will identify any distinctive features of that mouth. If there is a suspect, a cast of his mouth will be made and through a process of superimposition, the forensic dentist can then orientate the bite and the cast and see if he can find a match."

Such evidence has been used. "In Glasgow, we had a girl who was strangled and raped... a very vicious assault, and she had a bite mark on her breast," describes Marie. The forensic dentist was called in to document the bite and take a cast from a suspect's mouth. The forensic dentist was even able to describe the movement of the bite and show how the bottom teeth had remained in one position while the top had scrapped down. "It was absolutely fascinating, compelling evidence and the suspect then admitted that he had indeed bitten the victim."



"From our point of view, it would be more beneficial if every time a person goes to the dentist, their teeth are charted."

This type of evidence is not used often in court, but when it is it can be invaluable.

Dental records can help solve murders

In Ireland, dentists are not compelled by law to keep complete records of their patients. "It would be very helpful if there was a compulsion," says Marie, who finds that often a dentist will only have recorded the work he has carried out rather than a full chart of the patient's teeth. "From our point of view, it would be more beneficial if every time a person goes to the dentist, their teeth are charted. It something that wouldn't take a lot of time but it would be very helpful to us."

It is a hit and miss situation at present, says Marie. "There are some dentists who keep meticulous records, but there are others who have just records what they have done. That causes problems because then we have to keep going back in time until you find older records."

With records often providing a major clue to a person's identity, it is imperative they are kept up-to-date and accessible. "We are very reliant on there being ample ante-mortem information and it can be our downfall when we don't get enough," explains Marie. "An adult will usually, however infrequently, visit a dentist. So there usually is a current dentist and if they keep good records our work is made much easier."

If there is an inconsistency in the dental records, if for example a right upper incisor rather than a left upper incisor was recorded as missing, the result can have major implications. "If it just a coroner's case and there's plenty of other evidence to suggest who the person is, then one inconsistency in the dental record could be overlooked. But if it was a homicide then it is a different matter, because we would have to accept the written record as being correct and that the post-mortem record is correct and if they don't add up then there is a discrepancy and that can cause problems."

Of course there are situations where dental records are of little use. "If we open the mouth and there's not a tooth in the head, then you think 'oh no', especially if the gums have receded which means they probably haven't had their teeth for some years," says Marie who revealed in graphic detail how even without any identifying marks, the forensic dentist can still save the day. "We had a murder victim and the guys who had committed the murder had gone to great lengths to try to conceal the identity of their victim. They had chopped his fingers off so we didn't have fingerprints, they had smashed his face in so he was beyond recognition and they had obviously looked in his mouth and thought 'well he has dentures so there is no way can identify him from those'. By sheer chance I had asked the forensic dentist to come in to look at a mark on the body and he had a look and came back and told me the name of the victim. I asked him how he knew and he simply asked me if I had looked at the false teeth."

The victim's name was printed on his dentures.

"So the first thing I do with false teeth is get them out and have a look. Sometimes you even get a technician's mark so we can trace them back to where they are made. And, if you have a possible identity, you can ask them if they made teeth for so and so."

With Ireland's State Pathology department receiving a growing number of cases, it is imperative that it receives all the help it can get. As dentists, that help can be as straightforward as recording each patient's teeth on each visit and keeping that information in an easily accessible format. By doing so, you may just provide that vital piece of information that could identify a victim, or their attacker.

How can dentists help?

- Keep records that are up-to-date and accurate
- Check and chart teeth on first visits
- Keep records easily accessible and retrievable

Nicorandil-induced severe oral ulceration

Nicorandil has been shown to precipitate persistent ulcerative stomatitis in a small percentage of patients. To date over 50 cases have been reported, initially in France and, more recently, in the United Kingdom and Portugal, but this is the first report of nicorandil-induced ulceration in Irish medical or dental literature. It has been suggested that a previous history of aphthous ulceration may predispose the development of nicorandil-induced ulcers, although only one of these patients reported a history of recurrent oral ulceration (ROU).

Introduction

Nicorandil (N-[2-(Nitroxy)ethyl]-3-pyridinecarboxamide) is a relatively new potassium-channel activator with an adjunctive nitrate effect used as a vasodilator to control angina.

The drug was developed in Japan and it has been licensed and available in Europe since 1994; it is marketed under the trade name Ikorel or Icorel. It has been described as a hybrid between nitrates and potassium channel activators. It opens potassium channels causing sustained dilatation of both peripheral and coronary arteries, thus reducing cardiac after-load. The nitrate moiety dilates venous capacitance vessels to reduce cardiac pre-load.

The recognised adverse effects associated with nicorandil therapy, as listed in monthly index of medical specialities (MIMS) include headache, flushing, nausea, dizziness, hypotension and tachycardia. However, a number of cases of severe oral ulceration have been reported from several European countries including France, Portugal and the UK.^{1,2,3,4} Healy et al. recently published a report on oral ulceration in a series of four Irish patients.⁵ Other reports have cited incidences of anal ulceration.^{6,7,8}

While the mechanism of causation remains unclear, it has been postulated that metabolites of the drug may accumulate in the saliva especially in elderly patients. The tongue is the most frequently involved site, although ulceration of the labial and buccal mucosa, dorsum of tongue and fauces has also been reported. The time from commencement of therapy to ulceration ranges from one to 10 months, although delays of up to 36 months have been reported⁹. Maintenance doses are normally in the range of 10 to 20mg twice daily with

the maximum allowable being 40mg twice daily. It has been suggested that a minimum dose of 30mg daily is necessary to induce mouth ulcers.¹⁰

The paper reports on four patients (three male, one female) who were referred to the Oral Surgery Department, Cork Dental School and Hospital with a history of severe oral ulceration which was proving resistant to treatments provided. All four patients were taking nicorandil as part of a polytherapeutic regime (range nine to 11 drugs) for symptomatic control of ischaemic heart disease. Two patients were receiving 20mg twice daily and two were taking the maximum recommended dose of 80mg daily.

The average age of the patients was 74 years (age range 70 to 81 years).

Case one

A 72-year-old man was referred by his general dental practitioner (GDP) with a recent history of persistent severe oral ulceration. No cutaneous, ocular or genital lesions were reported. The patient was unable to wear his lower denture and was complaining of pain on eating and swallowing.

Past medical history included severe congestive heart disease for which he was under the care of a cardiologist. His medications included isosorbide mononitrate, amlodipine besylate, ramipril, aspirin, trimetazidine dihydrochloride, frusemide, metoprolol tartrate, nimesulide, pravastatin, fluoxetine hydrochloride and nicorandil (20mg four times daily) for ischaemic heart disease.

On examination, a non-indurated oval 1.5cm ulcer was seen on the left lateral border of tongue. This had been present for two

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months and had not responded to treatment with metronidazole, nystatin, or fluconazole. Two further areas of ulceration were noted on the right and left buccal mucosa. The ulcers were soft, painful, non-indurated with an inflammatory halo and a yellow/grey pseudomembraneous floor.

Two incisional punch biopsies of the tongue and buccal mucosa were made. The histology reported non-specific inflammation with no evidence of dysplasia.

The patient was treated initially with topical steroids (betamethasone 0.5mg four times daily as a rinse) and subsequently with systemic steroids (prednisilone 5mg daily). The ulceration on the buccal mucosa resolved but the lingual ulceration persisted. The cardiologist was consulted, the nicorandil therapy was discontinued and the ulceration resolved. At recent review, the patient has not had any recurrence of the oral ulceration.

Case two

A 74-year-old man was referred jointly by his GMP and by an ENT specialist with a history of a persistent painful ulcer on the right tongue, which had been present for three months.

He had a complex cardiovascular history including a coronary artery bypass graft five years previously, angina and a recent myocardial infarct. He was under the care of a cardiologist and his medications included isosorbide mononitrate, nicorandil (40mg twice daily), bisoprolol fumarate, atorvastatin, ramipril, aspirin, lansoprazole, trimethoprim, milpar and lactulose. The patient had a history of recurrent minor aphthous ulceration, which normally healed uneventfully within 10 days.

An incisional biopsy of the area, which was carried out two months earlier by the ENT specialist, reported inflammation in the area. The patient's full blood count including ESR, Rhesus Factor and autoantibodies, were all within normal limits.

On examination, a large (1.5 x 0.8cm) ulcer was seen on the right lateral border of tongue, in the anterior third. The lesion had begun



FIGURE 1: (a) Buccal sulcus ulceration in a patient on Nicorandil medication. (b) Tongue ulceration that persisted following steroid therapy.

Case three

An 81-year-old lady was referred by her GDP with a history of severe persistent and painful oral ulceration. The ulcer was present over three months and the patient was complaining of anorexia due to discomfort and dysphagia. She had a history of hypertension and angina, coeliac disease and was under the care of a cardiologist. Her medications included: thyroxine, lansoprazole, paroxetine, alendronate sodium trihydrate, verapamil hydrochloride, clopidogrel, tolterodine tartrate and nicorandil, which had been increased from 10mg twice daily to 20mg twice daily three months before the ulceration began.

On examination, an oval, shallow, yellow ulcer (1.4cm diameter) was seen in the right buccal sulcus with no evidence of induration, fixation or nodal involvement. A panoramic radiograph (OPG) revealed nothing abnormal. The lesion resembled the other cases of nicorandil-induced ulceration. In view of the advanced age of the patient, a decision was taken to defer biopsy and to treat the ulcer symptomatically with topical steroids for five days and review. On review, the lesion was greatly improved and the symptoms much reduced. However, the lesion subsequently increased in size and thus the consultant cardiologist was contacted to request termination of the nicorandil therapy. He agreed and the medication was discontinued. The oral ulceration resolved within two weeks.

on the tongue tip but was increasing in size and progressing posteriorly and onto the ventral surface. The tongue was soft, mobile with no evidence of induration or fixation. The ulcer was shallow with ill-defined edges and a yellow/grey floor. The surrounding tissue was inflamed and swollen. Two other areas of ulceration were noted on the upper left and lower right labial mucosa, each approximately 1cm in diameter. These had occurred more recently.

Two separate incisional biopsies were made and the histology reported parakeratosis, irregular acanthosis and severe chronic active inflammation extending into skeletal muscle. There was no evidence of lichen planus, no specific features and no evidence of dysplasia or malignancy. The patient was treated with topical and systemic steroids and while the buccal lesions healed completely, the ulcer on the tongue reduced in size (to 3mm) but failed to resolve. The cardiologist was contacted and agreed to discontinue the nicorandil therapy. The lesion on the tongue healed within three weeks and no new areas of ulceration have occurred.

Case four

A 70-year-old man was referred by his GDP with a six-week history of painful oral ulceration that had not responded to antifungal or antiviral agents and was causing dysphagia. His past medical history included angina, hypertension, ischaemic heart disease, hyperlipidaemia, angina and gastro-oesophageal reflux. He was under the care of a cardiologist and his medications included: glyceryl trinitrate spray, atenolol, triazolam, warfarin, esomeprazole, urea hydrogen peroxide, clopidogrel, and lisinopril and nicorandil 40mg daily.

On examination, several areas of shallow diffuse ulceration on the dorsum of the tongue were noted. A large (1.5cm) shallow ulcer was seen on the lateral border of tongue extending on to the dorsal and ventral surface, in the right anterior third. There was no evidence of induration and no nodal involvement. A panoramic radiograph revealed nothing abnormal. The patient also complained of generalised oral discomfort, particularly in the labial mucosa.

A punch biopsy and an oral swab revealed nothing abnormal. The histology report showed chronic and acute inflammation extending to the glossal muscle, with no evidence of dysplasia or malignancy. Topical steroids (betamethasone 0.5mg four times daily) were prescribed and while the symptoms improved considerably, a persistent area of ulceration remained on the right ventro-lateral border of the tongue. The cardiologist was consulted and gave consent for the patient to discontinue the nicorandil. The oral ulceration, generalised stomatitis and discomfort in the labial mucosa resolved completely within a week.

Discussion

Each of the above patients manifested severe oral ulceration, which failed to respond to routine therapy but resolved completely and without scarring once nicorandil therapy was ceased. While the daily dosage of nicorandil ranged between 40mg and 80mg daily, the ulceration occurred in one patient within 12 weeks of the dose being increased from 10mg to 20mg twice daily. It is important to note that histopathological examination was undertaken at an early stage to exclude malignancy, as this must always be considered in cases of intractable ulceration.

Drugs have been associated with many oral adverse effects ranging from xerostomia to gingival hyperplasia and ulcerative conditions such as erythema multiforme and lichenoid reactions. However, while over 50 cases of nicorandil-induced oral ulceration have been reported worldwide since 1997^{1-6,9,10}, this is the first such report in the Irish medical literature.

There is a need to increase awareness among general physicians, dental practitioners and cardiologists of the link between nicorandil and persistent oral ulceration. This is particularly relevant in Ireland where the population is ageing with an increase in the absolute number of elderly, many of whom have cardiovascular disease. The care of the elderly patient with multiple co-morbidities and poly-pharmacia is therefore becoming increasingly more relevant to the general dental practitioner.

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Transmissible spongiform encephalopathies and dentistry

Introduction

The transmissible spongiform encephalopathies (TSEs) are a group of neurodegenerative diseases caused by novel infectious agents, called prions. Stanley Pruisner first reported them in 1982¹ and described them as "proteinaceous infectious particles". The infectious agent is the prion protein (PrP), a glycoprotein, which is remarkably stable and resistant to breakdown within cells due to its tertiary structure. Once prions enter a brain cell, they accumulate to form amyloid-like deposits. This leads to degeneration and death of the cells, causing voids to occur within the brain (like a Swiss cheese or sponge), hence the term spongiform encephalopathy.

They are also remarkably resistant to conventional methods of disinfection and sterilisation.

The human TSEs are:

- Creutzfeldt-Jacob disease (CJD)
- Gerstmann-Straussler-Scheinker syndrome (GSS)
- Fatal familial insomnia (FFI)
- Kuru.

The CJD group is further divided into classical sporadic, familial, iatrogenic and (new) variant (nvCJD or vCJD) subtypes. vCJD is thought to be linked to bovine spongiform encephalopathy (BSE) in cattle and was first described in 1995. It is suggested that vCJD may be transmitted by ingesting foods from BSE-infected cattle. Person to person transmission of TSEs does not occur.^{2,3}

All human TSEs are very rare. The global incidence of CJD in all its forms is of the order of one per million people per year.

Two other TSEs, (GSS and FFI) are exceptionally rare, with an annual incidence of 1:10-100 million and appear to have an hereditary basis for transmission. Finally, Kuru has been known about since the 1950s, and was first described in the Fore Indian tribe of Papua, New Guinea. It is associated with cannibalistic funeral rites where the entire body is eaten (including the brains) of infected individuals. Over 2,000 cases had been reported before 1958, when ritualistic

cannibalism ceased. Most cases were seen in women, because, in the hierarchy of the Fore society, they were left to eat the offal and the brains of the victims (see **Table 1**).

Transmission of prion diseases in the health care setting

Iatrogenic transmission of CJD has been reported via neurosurgical and ophthalmic operations and by the administration of growth hormone derived from infected human pituitary glands. There is the theoretical possibility that vCJD may also be transmitted by these routes, although there are no reported cases to date.

Iatrogenic transmission of CJD has been associated with:

- *Dura mater* grafts (~110 cases worldwide)
- Human cadaver pituitary-derived hormone (~130 cases worldwide)
- Contaminated medical equipment (~seven cases worldwide, two probable, five possible)

The majority of *dura mater* graft cases all relate to one particular commercial product ("Lyodura"). This product was withdrawn from the Irish market in 1987. It is possible that the product may have been used in a small number of neurosurgical procedures up until 1993.⁴

There have been three cases of CJD associated with corneal transplantation (one definite, one probable, one possible). A detailed risk assessment is currently underway in the United Kingdom to determine if receipt of a corneal graft should be considered a risk factor for development of CJD.^{5,6}

One iatrogenic case of CJD was reported in Ireland in 2001, which was linked to prescription of human pituitary-derived growth hormone.

There is some evidence that other surgical procedures could potentially be associated with iatrogenic vCJD transmission. Unlike CJD the vCJD prion has been identified not only in brain and neural tissue, but also in peri-oral tonsillar tissue and spleen. The incubation period for vCJD is unknown and

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TABLE 1: Human TSEs

Disease	Route of acquisition	Incidence/distribution	Comments
Kuru	Oral, via cannibalism	Only seen in Fore tribe of Papua New Guinea	Ritual cannibalism stopped in 1958
Sporadic Creutzfeldt-Jakob disease (CJD)	Due to spontaneous mutation of prion protein	0.5-1 per million population worldwide	Most common human TSE
Familial CJD	Inheritance of mutation in (PrP) gene	10-15% of all CJD cases 100 families worldwide.	Autosomal dominant inheritance.
Iatrogenic CJD	Transmission of altered prion protein via a medical procedure	Very rare. Most cases related to <i>dura mater</i> grafts or human pituitary-derived hormone use. Only 7 cases (2 definite) associated with contaminated medical equipment.	All of the cases associated with contaminated medical equipment
Gerstmann-Straussler-Scheinker syndrome (GSS)	Inheritance of mutation in PrP gene	About 50 families identified worldwide	Autosomal dominant inheritance.
Fatal familial insomnia (FFI)	Inheritance of mutation in PrP gene	Very rare. Nine families identified worldwide	Autosomal dominant inheritance.
Variant CJD (vCJD)	Probably ingestion of BSE-contaminated animal products	Over 100 cases to date in the UK. One case in Ireland, probably UK-acquired	Wider distribution of altered PrP in human tissues compared to CJD

From: National Disease Surveillance Centre. 2004. *Guidelines on minimising the risk of transmission of transmissible spongiform encephalopathies in the healthcare setting in Ireland*.

so, it may be very many years, or even many decades, before iatrogenic cases are identified and the risk of iatrogenic transmission becomes clear.

Despite the probable rarity of iatrogenic transmission, the fact that prion proteins are so resistant to inactivation and that TSEs are invariably fatal, has prompted stringent precautions to be routinely taken to prevent iatrogenic transmission. It is perhaps as a result of the introduction of such precautions that no transmission of a TSE via contaminated medical devices has been documented since 1976.

There is no evidence that dental procedures are associated with iatrogenic transmission of CJD or vCJD. In the mouth, the most important tissue, which might potentially harbour the prion, is the neural tissue in the dental pulp. Scrapie, (the TSE that affects sheep) has been shown to have been transmitted in a hamster model by inoculation intraperitoneally and into dental pulpal tissue. Scrapie can be detected in dental pulp and gingival tissues. The clinical significance is unclear, particularly since, in humans, vCJD PrP has not been detected in alveolar nerve, tongue, dental pulp, gingiva or salivary gland in victims at autopsy. It was however demonstrable in the brain, trigeminal ganglia and lymphoid tissue, including tonsil^{7,8,9}. Dentistry is therefore considered a low risk activity for TSE transmission by the UK Department of Health.¹⁰

Infection control principles in dentistry, for known or suspected TSE cases

Disinfection and sterilisation

Prion proteins are extremely resistant to standard physical and chemical methods of disinfection and sterilisation. The standard autoclave regime (134°C for three minutes) is ineffective. Formaldehyde and ethylene oxide sterilising systems and dry heat are also ineffective. UV and ionising irradiation appear to have no activity on the prion. Neither do chemical disinfectants such as alcohols, aldehydes, propionolactones, hydrogen peroxide, iodophors, peracetic acid and phenolics. The only disinfectants with any observed

activity against prion proteins are 2M sodium hydroxide and 20,000ppm sodium hypochlorite (it is not known if the 2M sodium hydroxide is completely effective).¹¹

The recommended methods of inactivation of human TSE agents are:

- 20,000ppm available sodium hypochlorite for one hour, **or**
- 2M sodium hypochlorite for one hour, **or**
- Using a porous load steam steriliser, 134-137°C for a single cycle of 18 minutes, **or**
- Six successive cycles of three minutes each, (although an hour may be required).

If instruments are to be re-used, the most important procedure in reducing the possibility of iatrogenic transmission is pre-inactivation cleaning. The use of ultrasonics and washer-disinfectors in this process, decreases the bioburden dramatically, and increases the possibility of successful inactivation of prion protein contaminants on instruments by the methods listed above.

Risk stratification of patients

A system whereby all patients are stratified according to risk has been proposed⁴ and is presented in **Table 2** (over).

"At risk" patients are identified and are stratified into three categories. For patients who are not identified on medical history to belong to risk categories 1-3, routine decontamination and infection control procedures are adequate. For those identified as belonging to a risk group the following dental management strategies are proposed.

Dental management of known or high probability CJD Cases (Categories 1 and 2)

The most important principle in treating a known vCJD patient is that **absolutely all** instruments should be quarantined after use and disposed of by incineration.¹² Therefore, disposable instruments should be used whenever possible, including disposable handpieces and dental instruments, which are normally manufactured in metal. The number of instruments necessary for the procedure should be

TABLE 2: Patient risk categorisation

1: Symptomatic patients	1.1: Patients who fulfil the diagnostic criteria for definite, probable or possible CJD, or 1.2: Patients with neurological disease of unknown aetiology who do not yet fit the criteria for possible CJD or vCJD, but where the diagnosis of CJD is being actively considered
2: Asymptomatic patients at risk from familial forms of CJD linked to genetic mutations	2.1: Individuals who have or have had two or more blood relatives affected by a TSE, or a relative known to have a genetic mutation indicative of familial CJD, or 2.2: Individuals who have been shown by specific genetic testing to be at significant risk of developing a TSE.
3: Asymptomatic patients potentially at risk from iatrogenic exposure*	3.1: Recipients of hormone derived from human pituitary glands, e.g. growth hormone, gonadotrophin, or 3.2: Individuals who have received a graft of dura mater prior to 1994, or 3.3: Patients who have been exposed to instruments used on, or receipt of blood, plasma derivatives, organs or tissues donated by, a patient who went on to develop CJD or vCJD (Note: such exposures can only be classified as an exposure risk following appropriate look-back investigations and risk assessment)
*A decision on the inclusion of corneal graft recipients in the "iatrogenic at risk" category is pending completion of a UK risk assessment.	

minimised and only these instruments should be brought into the clinical area.

The handpieces should not be attached to the dental unit waterline because there is a risk of small amounts of potentially infected clinical material being drawn into the waterline (even in waterlines with anti-retraction valves). The waterlines are unlikely to withstand the necessary prion inactivation procedures above. If water-cooling is required, it should be administered from a syringe.

In view of the difficulties associated with disinfecting the dental unit, a portable suction unit with a disposable reservoir should be used. Patients should rinse their mouth into a disposable bowl rather than the cuspidor.

Patients should, in principle, be seen as the last case in the session.

Possible vCJD cases (Category 3)

If vCJD or other TSE is suspected, the patient should be treated at the

end of the clinical session, with the minimum number of staff, using disposable instruments wherever possible. Non-disposable instruments should be sterilised according to the above recommendations and quarantined.

If a TSE is confirmed in the patient, whilst the instruments are in quarantine, then the instruments should be incinerated.

Conclusion

The TSEs are a novel group of diseases, caused by prions that are characterised by extreme resistance to biocidal agents and techniques, whilst causing catastrophic neurological disease, usually resulting in death. The recent emergence of the BSE-associated vCJD variant, which may be transmitted by ingestion of infected bovine products, has raised the profile of these diseases, although they have been recognised for many decades. Person-to-person transmission does not appear to occur. Dental treatment would appear to be a low-risk procedure for disease transmission, except in patients who are identified in Table 2. For these patients, a dental treatment management strategy is proposed. Investigation into the TSEs, modes of transmission and methods of inactivation of prions is ongoing, and these recommendations are made in the light of current knowledge.

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A dental perspective on headache

In this second part of a three-part series, DR DERMOT CANAVAN discusses headaches and their relevance to the dental profession, with particular emphasis on migranes.



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Introduction

Headache (neurovascular) disorders frequently impact on the orofacial region and mimic toothache. The headache mechanism is generated within the brain, with pain mediated through the first division (ophthalmic) of the trigeminal nerve. Consequently, pain referral to the maxilla or mandible is not unusual. Odontogenic pain emanates from the dental pulp or periodontal tissues. This rarely presents a diagnostic challenge as symptoms of inflammatory disease or infection are manifested over time. In contrast, the management of non-odontogenic pain relates to a potentially complex differential diagnosis. Epidemiological studies confirm that headache disorders are common in an adult population. Primary headache disorders that may affect the orofacial area are described here. Migraine is reviewed in some detail as it provides a reasonable model for understanding the clinical and biological

aspects of headache problems. Accurate diagnosis is dependent on careful clinical assessment and a thorough 'pain history'.

Migraine

Acute migraine attacks are easily recognised as unilateral headache with nausea, vomiting, photo- and phonophobia (increased sensitivity to light and sound). At worst, pain is debilitating and described as intense throbbing/pulsating discomfort requiring high doses of anti-inflammatories or sleep for alleviation of the symptoms. Attacks can last for up to 72 hours. Females are more frequently affected than males. Peak incidence occurs in the third and fourth decade of life with one in three females reporting regular attacks of headache as against one in five males. The eye, forehead and temple are most frequently involved, but pain location can vary to possibly include the cervical spine, suboccipital region and orofacial area. Attacks may continue

TABLE 1: Precipitating factors in migraine

- Stress/anxiety
- Certain foods (chocolate, cheese, fatty foods, citrus fruit, etc)
- Alcohol (wine, beer, spirits)
- Menstrual change
- Intense sensory stimuli (intense light, loud noise, strong smells, dental treatment)
- Fatigue
- Weather change

TABLE 2: Symptoms associated with headache pain

- Nausea
- Vomiting
- Diarrhoea
- Photophobia
- Phonophobia

TABLE 3: Acute (abortive) migraine medications

- Nsaids
- Paracetamol (alone or in combination with anti-emetics, e.g. paramax)
- Combination analgesics (nsaids and codeine)
- Triptan class of drugs (zomig, imigran, frovex, etc)
- Opiates (rarely)

TABLE 4: Prophylactic (preventive) medications

- Beta blockers (e.g. Propranolol/ Inderal)
- Calcium channel blockers (Verapamil, Flunarizine)
- Anti-convulsants (Neurontin, Epilim)
- Tricyclic antidepressants (Amitriptyline, etc)
- Prednisolone (short courses for cluster headache)
- Lithium (cluster headache only)
- Ergot derivatives

throughout a patient's life but frequency tends to decrease significantly after the age of 40. The genetic basis of migraine is generally accepted (autosomal dominant) and a positive family history is frequently noted. Migraine with aura implies a sensory or motor disturbance that precedes the onset of pain. Sensory dysfunction is the most common form of aura and includes a variety of visual disturbances that should last for no more than 20 minutes and occur within the hour preceding the onset of headache pain. The sensory aura may include flashing white lights, visual blurring or distortion and inability to focus the eyes. The aura may be frightening for patients unfamiliar with the experience, while others may recognise it as a signal for the onset of facial pain or headache. In female patients, onset of migraine is strongly associated with hormonal change and a specific category of menstrual migraine has been described.

The common perception of migraine as described above is complicated by a huge variation in symptoms recognised in migraine patients. Variations include significant differences in pain location, duration, frequency, intensity and associated features.

Migraine type features may occur predominantly in the mandible and maxilla and can be confused with odontogenic pain. The term 'facial migraine' has been coined for this clinical condition, although sometimes used interchangeably with 'carotidynia'. The latter term refers to pain arising from the cervical carotid artery due to a migraineous mechanism or arterosclerotic disease. Raskin and Prusiner described facial migraine as being associated with tenderness of the carotid on the ipsilateral side and suggested that dental trauma might be a precipitating factor.¹ Further examples exist in the literature which document the onset of facial migraine after restorative or endodontic procedures. Most of the documented cases with facial migraine had a previous history of headache problems that were not necessarily facial in location. Moncada and Graff-Radford described a case of exertional facial migraine (i.e., pain triggered by intense physical exercise) presenting as a toothache.²

Mechanisms of pain

The substance of the brain itself is insensitive and lacks pain (nociceptive) fibers. However, the dura mater and blood vessels of the meninges are innervated by fibres originating in the ophthalmic

division of the trigeminal nerve. These fibres, in addition to the trigeminal nucleus, constitute the trigeminovascular system.³ The mechanisms of headache pain have not been fully elucidated but the original vasogenic theory correlated reduced blood flow through the cortical lobes of the brain with a reactive hyperperfusion resulting in dilation of cranial blood vessels. It is now accepted that inflammatory mediators like Substance P, CGRP and Neurokinin A are released in the walls of blood vessels within the meninges. This sterile inflammatory response coincides with increased sensitivity of the nerve endings, triggering pain in the ophthalmic division of the trigeminal nerve. The current crop of migraine abortive drugs (i.e. the triptans) were genetically engineered to interact with receptors on sensory nerve endings mediating control of pro-inflammatory peptides like those described above.

Treatments are initially based on a non-pharmacological approach, which highlights elimination of known headache triggers such as excessive caffeine intake, red wine, aged cheeses, chocolate, etc. Sleep deprivation and dieting are also recognised as triggers for migraine. The pharmacological approach to headache control is based on the use of either prophylactic or abortive medications.⁴ The decision to use prophylactic medications is based on the patient reaching a critical level of headache frequency, which negatively impacts on quality of life. The optimum choice of medication is dependent on a number of factors including patient age, gender, general health, headache frequency, etc.

Keys to diagnosis

The diagnosis of headache disorders is based on careful evaluation of the 'pain history', with confirmed absence of underlying pathology including dental and neurological disease. Episodes of pain that last for hours to days at a time and are throbbing/pulsating in nature could be either dental or headache related. However, common trigger factors for migraine, including sleep deprivation, ingestion of certain foods, menstrual change, fatigue, etc, are unlikely to affect dental pain. In addition, factors associated with the painful episode including nausea and vomiting, or dramatically increased sensitivity to light, sound, smell and taste are rarely associated with dental disease. Confusion may arise where strong sensory input triggers the initial

attack of pain. In a dental setting, the sensory input could be provided by routine dental restoration, oral surgery, endodontic therapy, etc. Diagnosis of facial migraine may be confirmed by a positive response to a specific migraine abortive drug, for example, a 'triptan' such as zomig, imigran, etc.

Cluster headache

Cluster headache is a primary headache disorder although it may co-exist with migraine. The painful attacks are shorter in duration (15 to 180 minutes) but much more intense. Attacks can occur up to eight times per day. Men are affected more than women (3:1). Pain intensity is often described as excruciating (an obsolete name for the condition is suicide headache, reflecting the intensity of the discomfort). The site of pain may vary but most frequently occurs in the peri-orbital area. However, it may affect the lower half of the face. When present in the orofacial region it may mimic acute pulpitis. The prevalence is approximately 0.3 per cent.

There are two main forms of cluster headache: episodic and chronic.⁷ The episodic form is thought to be seasonal (spring and autumn), reflecting involvement of the hypothalamus in the mechanism of the condition. The chronic form affects approximately 20 per cent of patients and has a serious impact on quality of life. The attacks of pain are more likely to be triggered by sleep, in contrast to migraine which is usually relieved by sleep. Symptoms characteristic of autonomic activation may accompany the disorder, including lacrimation and conjunctival injection (tearing and redness of the eye), nasal congestion or rhinorrhoea, and forehead or facial sweating. Drooping or soft tissue swelling of the upper eyelid (ptosis) is also characteristic. Patients frequently present in an agitated state due to the excruciating nature of the painful attack.

Klapper et al reported the delay in accurately diagnosing this condition and suggested an average time of 6.6 years before appropriate treatment was instituted.⁵ It is not surprising therefore that many patients with this disorder have unnecessary dental interventions including (in some cases) multiple extractions. It has been reported that the cluster attacks may be triggered by dental intervention in patients susceptible to attacks. Of patients described by Brooke, 100 per cent had pain in the oromandibular region, 53 per cent with toothache and 47 per cent with jaw pain. Bittar and Graff-Radford described 42 patients with cluster headache, of whom 65 per cent received unnecessary dental treatments because of the facial presentation.⁶

Treatment is limited to the use of a small number of medications used on a preventive basis. The drugs known to be effective include Epilim, Lithium, Ergot derivatives and possibly Neurontin. Intravenous steroids are often effective in aborting the cluster cycle. A limited number of surgical interventions have been described but strong evidence for their support is lacking.

Paroxysmal hemicrania

Paroxysmal hemicrania represents a group of disorders with a similar pathogenesis to cluster, but the clinical presentation is slightly different. The condition is more common in females (2:1) and the

attacks of pain are relatively short (five to 15 minutes). These painful episodes may be located (unilaterally) within the orofacial region and present as 'toothache'. They occur frequently throughout the day with some nocturnal activation. Associated features include ipsilateral lacrimation (tearing), conjunctival injection (redness of eye), nasal congestion, rhinorrhoea, ptosis or eyelid oedema. The additional clinical features are thought to be associated with parasympathetic activation mediated through the facial nerve.

Diagnosis is based largely on the periodicity of the painful attacks, possibly with identification of associated autonomic features. This condition is known to occur in either an acute or chronic form, with a high level of response to a specific NSAID Indomethacin (Indocid). Patients frequently describe this condition as an intense throbbing pain that comes in 'waves' and is localised to a specific tooth or within a quadrant. It has an abrupt onset but unlike odontogenic pain it tends to 'switch off' after five to 15 minutes.

Delchano and Graff-Radford described two patients with CPH who presented with the pain primarily in the tooth but radiating to the maxillotemporal regions of the face. Both patients were well controlled with Indomethacin.⁸

Summary

Patients complaining of pain in tooth bearing regions of the oral cavity may be suffering from a disorder unrelated to pulpal pathology. Unnecessary dental procedures may complicate the diagnosis and aggravate the underlying disorder. Referral of pain to the oral cavity and teeth may easily be explained by the extensive neurological connections of the trigeminal brain stem complex with other cranial nerves and input from the upper segment of the cervical spine. Accurate diagnosis of painful disorders can be a complex and time consuming process. The primary responsibility of the dentist in this scenario is to rule out the possibility of odontogenic pain.

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The provisional crown



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The provisional crown is an interim restoration that is used for a variable time period while the definitive restoration is being fabricated. Although an interim treatment, the provisional is an extremely important restoration whose requirements differ only slightly from the permanent restoration it precedes.^{1,2} A good provisional crown ensures optimal tissue health facilitating the subsequent management of the tissues.³ It can also provide critical diagnostic information with respect to occlusion and aesthetics particularly in more complex treatment plans where occlusal and or aesthetic changes are planned.⁴ When poorly made, they can hinder the prognosis of the definitive restoration, the periodontal health and final aesthetics. Objectives not achieved in the provisional are unlikely to be realised in the permanent restoration.

Functions of the provisional restoration

The functions of the provisional restoration⁵

are summarised in **Table 1**. The most basic function of the provisional is to cover the tooth preparation, protect it from trauma (thermal, chemical and mechanical) and caries, and allow the tooth to function while the definitive restoration is fabricated.

Another important function is its diagnostic role. The provisional crown can be instrumental in developing optimal aesthetics particularly when changes are planned in the aesthetic zone. The proposed changes should always be made in the provisional so that the patient and dentist have the opportunity to evaluate the proposed changes. Any problems can then be addressed in the provisional prior to fabrication of the definitive restoration.

The effects of proposed changes in occlusal schemes (e.g. changes in vertical dimension, the development of canine guidance) should also be evaluated for patient acceptance in provisional restorations. This allows for evaluation of the effects on speech, function (swallowing and chewing) and aesthetics. Any necessary changes can be more easily made in the provisionals.

The provisional crown is also valuable in providing an indirect method of measuring the amount of tooth reduction made during preparation. An Iwansson gauge can be used to measure the thickness of a provisional crown (**Figure 1**).

From a periodontal perspective, properly fitting and contoured provisional crowns support the health of the periodontal tissues and facilitate impression making. When crown lengthening procedures are

TABLE 1: Functions of the provisional crown	
Protection:	Protect the preparation from thermal, chemical and physical trauma. Protect the preparation from caries. Protect the periodontal tissues by facilitating good oral hygiene.
Positional stability:	Prevent migration of the tooth. Promote soft tissue stability with optimal contours.
Mastication:	Provide good masticatory function.
Aesthetics:	Improve aesthetics and allow patient evaluation of any proposed changes.
Diagnostic information:	Allows patient to evaluate proposed aesthetic changes, changes in vertical dimension, and effects on speech. Allows assessment of whether the patients expectations have been met. Limitations of treatment outcome can also be identified.



Figure 1: An Iwansson gauge used to estimate tooth reduction indirectly.

TABLE 2: Desirable properties of an ideal provisional restoration material

Biologic:	- Biologically acceptable to periodontal tissues or tooth structures - non irritating to pulp and other tissues	Aesthetic:	- Easy to repair or make additions - Acceptable shade selection - Highly polishable - Reasonable aesthetics for the duration of wear
Physical:	- Strong and durable - Non porous - Good surface hardness - Dimensionally stable - Wear resistant - Good marginal fit	Chemical:	- Colour stable and stain resistant - Low exothermicity during polymerisation - Low polymerisation shrinkage - Low residual monomer
Manipulation:	- Easy to mix - Easy to load - Short setting time	Economic:	- Relatively inexpensive

performed, a period of six weeks is advised before making the final impression for the definitive restoration.

Classification of provisional crowns

Provisional crowns may be classified in a variety of ways; including:

1. The material from which they are made;
2. Method of fabrication - direct or indirect methods; and,
3. The length of use.

1. Provisional crown materials

The ideal properties of a provisional crown material are listed in **Table 2**. No ideal material exists, but a variety of materials have been used successfully.⁶ The selection of material should be based on a number of criteria, including; the length of time the provisional crown will be used, strengths and weaknesses of the particular material relative to the clinical situation, and personal preference and experience of the operator in using a material. The literature tends to favour the use of acrylic resin as the material of choice when making provisional restorations.⁷

Materials used for the fabrication of provisional restorations include:

- Polymethylmethacrylate resins (PMMA);
- Polyethylmethacrylate resins (PEMA);

- Urethane dimethacrylate resins; and,
- Bisacryl composites.

Table 3 compares the various important properties of materials related to provisional restorations.

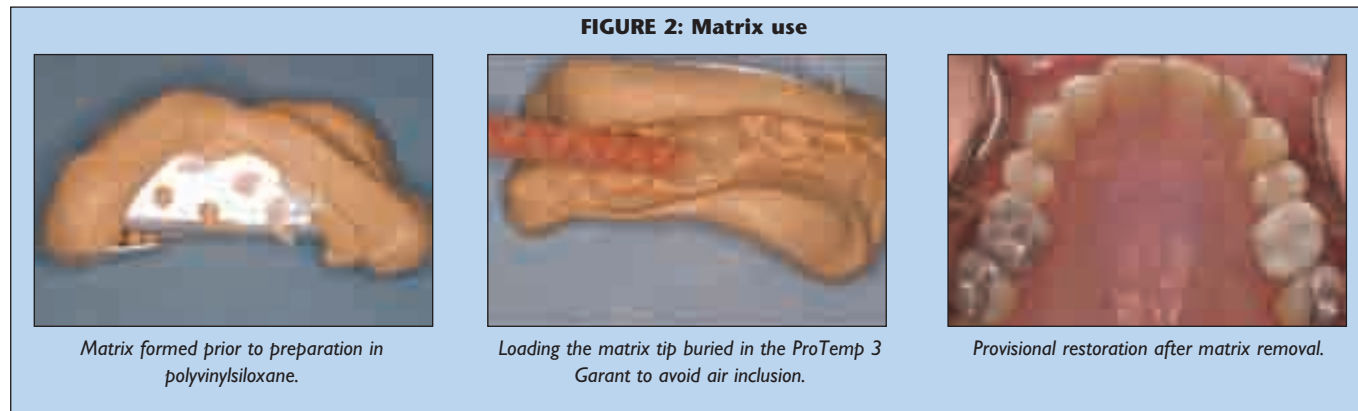
Polymethylmethacrylate resins (PMMA) e.g. Jet (Lang Dental) and Duralay (Reliance Dental), which were introduced in the 1940s and are probably the most frequently used materials. They have very good strength and high wear resistance.⁸ However, these materials generate considerable heat when polymerising and ideally the provisional should be fabricated using an indirect technique. PMMA has a strong tendency to shrink with high residual monomer content. *Polyethylmethacrylate resins* (PEMA) e.g. Snap (Parkell) and Trim (Bosworth) were introduced in the 1960s. They generate less heat on polymerisation and experience less shrinkage than the PMMAs. Less residual monomer is released by PEMAs and this material is relatively well tolerated by the tissues. It is easy to make additions to the crown if necessary, and these materials are relatively inexpensive. Although the colour stability is not as good as PMMAs, PEMA may be a better choice when direct provisional prosthesis fabrication is considered (i.e. chairside).³

Urethane dimethacrylate resins, e.g. Triad (Dentsply), are visible, light-cured materials that usually have a filler to reduce the polymerisation shrinkage. The material is well tolerated by the tissues, is reasonably aesthetic but is a relatively expensive material.

Bisacryl composites, e.g. ProTemp II (ESPE), ProTemp Garant 3 (ESPE). Most of these materials consist of a bis-acryl resin mixed with an inorganic filler. These systems are available with an auto delivery system making them very efficient and easy to use but more expensive. Bis-acryls are compatible with other composite materials and additions can be made, but these can prove difficult and unpredictable.⁹ These materials generate minimal heat during the polymerisation reaction. There is also less shrinkage than the acrylics, imparting good marginal fit.^{10,11}

Bisacryl composites are well tolerated by pulpal and periodontal tissues and have good colour stability. It has been reported in the literature that some practitioners have found this material difficult to manipulate before setting because the handling properties are more technique sensitive.^{7,12}

FIGURE 2: Matrix use



Matrix formed prior to preparation in polyvinylsiloxane.

Loading the matrix tip buried in the ProTemp 3 Garant to avoid air inclusion.

Provisional restoration after matrix removal.

TABLE 3: Materials and some properties of materials used for provisional restorations

Acrylics e.g. PMMA self or heat cured	Acrylic e.g. PEMA	Urethane dimethacrylate e.g. Proviopont	Bisacryl Composites e.g. ProTemp Garant 3
Great heat in polymerisation	Less heat than PMMA	Exothermic reaction	Generate minimum heating during polymerisation
Strong tendency to shrink	Less shrinkage than PMMA	Polymerisation shrinkage less of a problem Light curable-control of set	Shrinkage less than acrylics-imparting good marginal fit. ⁹
High residual monomer as result of shrinkage	Some residual monomer	Less free monomer than methacrylates. ⁷	No residual monomers
Unpleasant smell produced when in use over a long period of time	Colour stability not as good as PMMA	Monomer can cause pulp and gingival irritation. Marginal fit can be poor but additions possible	Rarely cause irritation of pulp or periodontal tissue. Good biological tolerance
Poor toughness and low colour stability		Colour reasonable	Good colour stability and good polishability
Easy to add to	Easy to add to	Additions possible	Additions difficult
Cheap	Cheap	Expensive	Expensive
PMMA good strength and high wear resistance. ⁸	Strength reasonable for most purposes	Good mechanical properties	Reasonable strength

2. Method of fabrication of provisional restoration-direct (chairside) or indirect (in the laboratory)

Direct methods of fabrication

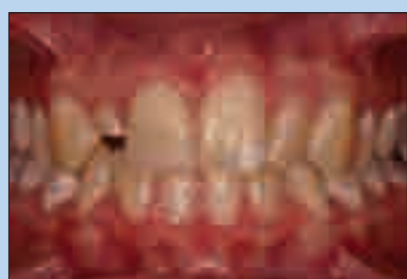
1. Matrix use

- A vacuum formed matrix of the diagnostic wax up, or an impression of the existing tooth can be used as a matrix for the provisional crown (see **Figure 2**).
- Petroleum jelly should be used to lubricate the tooth preparation

and the provisional crown material is placed into deepest part of matrix and seated on the prepared tooth.

- The matrix is removed when the provisional material is at the rubbery stage, and seated and resealed during the polymerisation reaction. Final set is accelerated by the use of hot water if a methacrylate is being used.
- The provisional crown is then trimmed and polished as described at a later stage in this article.

FIGURE 3: Polycarbonate crown selection and modification.



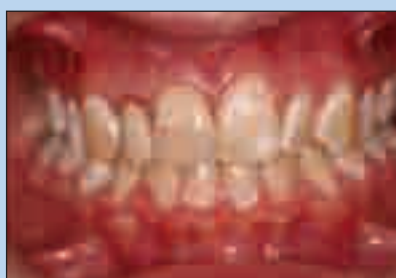
Preoperative view in MIP.



Selection of correct mesiodistal width of polycarbonate crown to replace.¹²



Polycarbonate crown relined with Snap and markings made to adjust contours to achieve similar shape to 22.



Post-operative view in MIP post finishing and cementation.

2. Proprietary crowns

Polycarbonate crowns or metal crowns (aluminium or stainless steel) can be relined with acrylic resin to provide a custom fit (**Figure 3**).

- A crown with a similar width to the tooth is selected and the cervical margins adjusted as necessary.
- The prepared tooth is lubricated with petroleum jelly.
- The prefabricated crown is loaded with resin and seated.
- The incompletely set excess is then removed and the crown removed and replaced to control the polymerisation reaction. Any adjustments and polishing procedures are then performed.

For posterior teeth, stainless steel crowns or aluminium shells may be used. Aluminium shells are very ductile and thus can be quickly adapted to the tooth. This can also result in rapid wear and perforations can occur during function resulting in tooth movement.¹³ Some of these crowns, e.g. Iso-Form Crowns (3M Dental Products), have reasonable ductility with the occlusal table reinforced and are therefore more

resistant to wear related failure.¹³ Stainless steel crowns can also be used but these can prove difficult to adapt to the prepared tooth.

Indirect methods of fabrication (provisional restorations made in the dental laboratory)

There are various techniques for making provisional crowns in the laboratory that have the advantage of preventing contact of monomer with the tooth preparation. An impression can be made of the actual tooth preparations, poured in stone and the provisional made on this working cast in the laboratory. This obviously necessitates having laboratory facilities available. An alternative technique is to have the provisional crown premade prior to cutting the crown preparation. The basic steps for fabrication include:

- a cast of the proposed restorations is duplicated and a matrix is made;
- mini preparations are made on the cast and a separating agent used; and
- acrylic PMMA is packed into the matrix and seated on the preparations. This can be cured under pressure and heat applied during the polymerisation reaction. This results in increased hardness, density, reduced porosity and a stronger provisional restoration.
- If necessary the shell crowns may be relined chair-side, after the preparation is made.

Another technique involves the use of denture teeth facings on the facial aspect with acrylic resin processed onto the lingual. The advantage of these provisional restorations include excellent aesthetics combined with strength due to the increased hardness and density of laboratory processed acrylic resin on the palatal.

Base metal alloy provisional crowns may also be fabricated. In this case, the crown is waxed up in the normal fashion and cut back for an acrylic facing. Retention beads are used to facilitate retention of the acrylic facing. Acrylic resin is then processed to the facial surface. Metal provisional restorations are normally used if the anticipated length of time of wear is long.

3. Length of use

- Short-term - several days to week
- Medium-term - several weeks
- Long-term - several months

Where an extended time of use of a provisional restoration is anticipated, physical properties such as hardness, strength and density are more important. Low strength and crack propagation are the commonest causes of failure of acrylic restorations. Studies that tested methods to improve longevity of indirect acrylic restorations found that polymerisation with pressure was the variable that produced the greatest effect in increasing strength and reducing porosity.^{14,15,16} Indirect methods of fabrication increased wear resistance, increased density, reduced porosity, ensured more colour stability and resulted in a crown that was more resistant to fracture.¹⁵

For long-term provisional crowns, base metal alloys, with or without acrylic facings, can also be used where necessary.¹⁷ These provisional restorations are useful where a long period of wear is anticipated,



FIGURE 4: Armamentarium for polishing and finishing.

where occlusal forces dictate, or where diagnostics are being assessed. Increased laboratory costs also arise and should also be considered. Fibres may also be used to increase rigidity and enhance fracture resistance. Materials such as Ribbond, (Ribbond Inc, Seattle, Wash), which is a plasma-treated polyethylene fibre, can be used as a substructure and a composite material such as Belleglass can be used to fabricate the provisional restoration. Other materials such as stainless steel wire, ultra thin stainless steel bands and stainless steel mesh have been reported in the literature as appropriate for use when increasing strength and fracture resistance of provisional restorations.^{2,18}

Importance of finishing a provisional restoration

Rough surfaces promote plaque accumulation, which can cause aesthetic and periodontal problems.¹⁹

As with any polishing and finishing procedures, a stepwise approach is recommended using the coarser material first and gradually working to the finest. This decreases the number of scratches on the surface of the restoration and ensures that a highly polished surface with a good appearance results. Tungsten carbide burs in a slow or straight hand piece can be used for gross reduction of excess, followed by Soflex discs of varying roughness and KY gel as a lubricant. **Figure 4** shows some of the equipment that can be used for polishing and finishing provisional restorations. Provisional restorations can be finished using pumice on a wheel or a rubber cup for a high polish. Staining kits (e.g. Candolor) can be used to characterise the provisional restoration by incorporating some heterogeneity into the shade of the restoration so that a more natural result can be achieved (**Figure 5**). These stains tend to wear off with time.

Overcontouring of provisional crowns is a significant causative factor of gingival inflammation^{20,21} but under contouring has little if any effect on gingival health.²⁰ It is important to bear this in mind when shaping the provisional crown.

Provisional luting materials

The luting material for provisional restorations is primarily used for its sealing ability.²² The type selected depends on the length of time the

FIGURE 5: Candolor kit for customising and staining provisional crowns



Indirect provisional crown prior to staining.



Staining with Candolor in cervical one third.



Staining with blue stain in incisal one third to provide translucent effect.

restoration is to remain in place, for example, Temp bond (Kerr) is useful if the provisional is to be of short duration, whereas polycarboxylate cement, e.g. Ultratemp (Optident), is useful if a longer period of wear is anticipated. The retentive requirement for a provisional luting material is that it is strong enough to retain the

restoration during the course of treatment while allowing easy removal of the restoration when required.²²

The importance of removing all excess provisional luting material cannot be overemphasised to avoid damage or adverse response of the periodontal tissues.

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Some of the commonly used provisional luting materials contain eugenol, which has a plasticising effect on composite material. As a result, eugenol-free materials have gained increasing popularity, particularly where dentine bonding is considered with the definitive restoration.²³ Surface hardness and bond strength of resin to resin can be affected by eugenol.^{24,25,26} However, resin bond strengths to enamel and dentine are not affected if the eugenol residue is removed with pumice and water before conditioning.^{27,28,29}

Conclusion

In conclusion, the provisional crown should be considered a template of the final restoration in all aspects except the material from which it is fabricated, its longevity and the colour and translucency achievable. A good provisional crown saves time and expense at subsequent appointments and proper fabrication of the provisional restoration facilitates the production of better definitive restorations and a healthy periodontium. It is also critical to accomplish all treatment objectives with the provisional prior to replacing it with the definitive restoration.

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Endodontic update

The Journal of the Irish Dental Association presents a series of abstracts of recent presentations at the Irish Academy of American (IAAGDS) trained dentists in the Helix, Dublin.

Endodontic diagnosis



Dr Mary Freda Howley

Most oral facial pain and disease are of pulpal or periradicular origin. However, to consistently make an accurate diagnosis, a step-by-step approach should be used in all cases.

A comprehensive history of the complaint is essential. The location, character of the pain, intensity, duration, trigger factors, initiating

and relieving factors should all be obtained. A tentative diagnosis may then be reached, but clinical objective tests are needed to confirm the diagnosis. The objective of the tests is to identify the causative tooth and if possible to reproduce the symptoms.

The following objective tests should be performed on all cases:

- pulp tests - thermal and electric;
- percussion test;
- palpation test;
- periodontal probing; and
- periapical radiograph- straight and angled.

It is important to note that the absence of radiographic changes does not always indicate a healthy pulp. Radiographic changes are not usually seen in pathologically vital pulps or recently necrosed pulps.

Peri-radicular lesions of pulpal origin will commonly have the following three radiographic characteristics:

- loss of the lamina dura apically causing widening of the periodontal ligament

space;

- a radiolucency resembling a hanging drop; and,
- a radiolucency remaining at the apex regardless of the angulation.

Studies have shown substantial inconsistency in both inter and intra-observer interpretation of radiographs. Therefore, radiographic findings should correlate with both history and clinical tests.

The following are additional special tests that may be used to provide additional information or confirm a diagnosis:

- bite test using a tooth sleuth;
- translumination;
- test cavity in a necrotic tooth;
- selective local anaesthetic; and,
- trace a sinus tract, if present.

In conclusion, if the aetiology is still unclear after clinical and radiographic examination and the patient's symptoms cannot be reproduced, the case should be treated conservatively and reviewed or referred for a second opinion before definitive treatment is provided.

Wash and go: endodontic irrigation



Dr Pat Cleary


The prime objectives during root canal treatment are cleaning, shaping and obturation.

Whereas some of the newer nickel-titanium endodontic instruments may allow for a more efficient shaping of the root canals, it is still critical to understand that "files shape" and something else is necessary to obtain clean root canals. Remember, studies of the anatomy of roots (Hess) had demonstrated that root canals contain a myriad of lateral and accessory canals, isthmuses, fins and deltas. In fact, there are many areas of root canals that cannot be instrumented. To clean these areas, we depend on the flushing, anti-bacterial and tissue dissolving effects of

irrigants. In addition, the irrigants act as lubricants reducing the stresses on instruments used during preparation.

The most common effective irrigants are sodium hypochlorite (NaOCl), EDTA and chlorhexidine. Local anaesthetic or saline solutions are only useful as flushing agents or prior to verifying the position of instruments within the root canal (reducing the risk of a hypochlorite accident).

Sodium hypochlorite is the most popular irrigant and is considered essential by the vast majority of endodontists. It may be used full strength (5.25 per cent) or can be diluted. The anti-bacterial effects remain as good with dilution but the tissue dissolving



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effects are reduced, necessitating additional time to dissolve any remaining tissue in the canal.

Caution is required with the use of NaOCl, as extrusion of this caustic chemical will cause severe pain and possible irreversible tissue damage. Precautions include:

- a) use light pressure;
- b) use a modified endodontic needle;
- c) confine the needle to the root canal;
- d) use continuous movement in the canal while irrigating; and,
- e) make sure the needle is loose and not wedged in the canal.

EDTA is useful to remove the smear layer, which studies have indicated can be detrimental to the seal of filling materials. It may also be used to chelate calcium and soften the root canal walls, aiding preparation.

Chlorhexidine gluconate as a two per cent solution has been shown to have very good anti-bacterial effects. It has no tissue dissolution effects but can be an effective adjunct, especially in retreatment cases. It can also be used as a final rinse to neutralise the effects of NaOCl, which is necessary for the use of Resilon sealer and obturation materials.

Does size matter?



Dr Ray Bellamy

Thorough cleaning and shaping of the root canal system is necessary to eliminate endodontic pathology. Recent literature on this subject shows a tendency to remove increasingly large amounts of dentine from the tooth in order to eliminate tissue, bacteria and bacterial bi-products from the root canal system.

Over preparation and consequent enlargement of the canals, apical area and constriction can lead to weakening of tooth structure, transportation of canals, perforation, post-operative discomfort and delayed healing. Acknowledgement of the permeability of dentine structure can and ought to be used when

combined with antibacterial and solvent irrigants to clinical advantage, thereby enhancing the potential for success. Close attention should be paid to the selection, delivery, use and strength of irrigants in order to disinfect the dentine of the root canal system thereby reducing the need for unnecessary removal of dentine structure.

A thorough knowledge and respect for the anatomical landmarks and their dimensions is essential. Adherence to the mechanical and biological objectives of root canal therapy ensure the maximum potential for endodontic success.

RCSI 2004 Annual Scientific Meeting

AISLING O'MAHONY reports from the Royal College of Surgeons in Ireland 2004 annual scientific conference, which was held recently in Dublin.



The Edward Leo Sheridan Medal is presented to Professor George Zarb, Toronto, by Professor Niall O Higgins, President RCSI.

The Royal College of Surgeons in Ireland (RCSI) 2004 Annual Scientific Conference, entitled 'Restorative Dentistry – State of the Art' was an excellent conference that gave an up-to-date review on all aspects of restorative dentistry. The meeting covered a wide number of topics by many international and national speakers. The topics covered ranged from caries management to endodontics, complete dentures to resin bonded bridges, amalgam to all ceramic restorations, and all aspects of fixed prosthodontics from tooth preparation to cementation techniques and maintenance issues.

Professor John Osborne discussed the controversy over amalgam and gave a thorough review of the literature related to 'amalgam illness patients', as well as discussing the best amalgam products available.

An excellent review of many aspects of endodontics was given by Drs Johanna

Glennon and Pat Cleary, who discussed root morphology and instrumentation techniques. Dr Glennon discussed the advantages of digital radiography, fourth generation electronic apex locator irrigants, when and when not to do one visit root canals and the new filling material Resilon. Dr Pat Cleary gave a comprehensive review of endodontic diagnosis and when it is necessary to retreat. Dr Therese Garvey discussed how useful orthodontics can be in restorative treatment planning and how important it is to have a team approach.

Professor Trevor Burke challenged traditional preparations that often result in loss of considerable tooth structure and suggested that bonded ceramic restorations should be considered (less destructive, similar or higher success rates). He is a fan of the newer self-etch resin cement, Unicem, that has simplified the bonding process.

Post and cores were thoroughly covered in two lectures by Dr Michael O'Sullivan. He suggested that cast posts are optimal in some cases, while prefabricated are better suited for other cases, with similar success rates for both.

Dr Harold Prieskel, a world leading authority on attachments for removable partial dentures discussed the importance of evidence-based dentistry and how we need to question new techniques before using them on patients. He reminded the audience that RPDs are still an excellent treatment option for many patients and should not be viewed as the poor man's fixed partial denture. They are particularly suitable for cases of extensive bone loss, where grafting procedures or nerve repositioning are necessary prior to implant placement. Dr Finbarr Allen discussed the distal extension partial denture and the altered cast technique.

Dr Gerry Cleary discussed the evolution of all ceramic restorations and discussed the most suitable applications of the systems that are

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Some of the lecturers who chaired the RCSI Annual Scientific Conference were (from left): Frank Burke, Therese Garvey, George Zarb, Colm Sugrue and Pat Cleary.

currently available on the market. Dr Sean MacCarthy discussed how best to prepare teeth for veneers and his cementation technique. Dr Marvin Kelleher gave an excellent talk on bleaching and how it can produce excellent aesthetic results that could only otherwise be achieved with aggressive tooth preparations and ceramic restorations. Dr George Zarb gave an eloquent and logical state-of-the-art address on how implant dentistry has changed dentistry and our treatment planning. He gave a fascinating overview on where we are in implant dentistry.

Dr Billy Davis discussed the principles of tooth preparation and Dr Edward Owens gave an excellent lecture on the importance of provisionals and how best to fabricate them. Dr Shane White discussed luting agents and comprehensively covered all areas related to cementation. Dr Ned Van Roekel and Dr Paul Quinlan provided some very interesting information on the longevity of various restorations and expected treatment outcomes, while also addressing maintenance issues.

Other topics covered included complete dentures (Dr Eamonn Croke), caries management (Dr Frank Burke), resin bonded bridges (Dr David Hussey), impression making (Dr Kevin O'Boyle).

It was truly a fantastic meeting and more importantly showcased the extremely high standard of dentistry being done in Ireland. I would like to congratulate those involved in putting together such an outstanding meeting.



An attentive audience at one of the absorbing lectures that were held as part of the Annual Scientific Conference.

Health Board Dental Surgeons AGM 2004

Ciara Murphy, Deputy Secretary General of the Irish Dental Association reports from the 2004 Annual General Meeting of the Health Board Dental Surgeons Group, which took place recently in the Connemara Coast Hotel in Furbo, Co Galway.



At the AGM (from left): Mary Galvin, Dr Michael Galvin, President IDA; Tom Mooney, Maeve O'Connor, President HBDS Group; and Mary Mooney at the recent HBDS AGM.

The AGM was well attended and members expressed broad satisfaction in relation to the work of the outgoing committee.

The committee had circulated a report of its activities prior to the meeting. Work undertaken included submissions in relation to the impending health service reforms, together with a proposal in relation to the introduction of a new grade within the Health Board Dental Service – Director of Oral Health. The Irish Dental Association will be seeking discussions on these submissions with the new Health Service Executive, when it is formally established in January 2005.

Two motions were received from members for discussion at the AGM. The first motion related to the proposed adoption of the revised rules of the HBDS Group Committee. This motion had been previously brought before the 2003 AGM, at which time it was felt that further consultation with the members was necessary before any changes were adopted. Submissions were received by a number of members in relation to the revised rules of the Group and were debated at committee level. Following brief discussions in relation to the definition of membership of the Group, Dr Margie Houlihan (President) proposed the adoption of the revised rules. This motion was seconded by Dr Maeve O'Connor (President Elect) and passed unanimously.

The second motion before the meeting related to the recognition of employment in the Health Board Dental Service as creditable work experience for the MFDs examination. In proposing the motion, Dr Patrick Quinn highlighted the anomaly that existed between Ireland and the UK in this regard, i.e., that employment in the public service in the UK is considered creditable work experience for the MFDs examination.

The HBDS 2004 AGM confirmed the election of the new committee

Name	Position	Proposed	Secunder
Dr Maeve O'Connor	President		
Dr Margie Houlihan	Vice President		
Dr Anne Crotty	President Elect	Dr M Houlihan	Dr A O'Neill
Dr Benvon Lyons	Secretary	Dr M Houlihan	Dr L Burke
Dr Niamh Nic Cartaigh	SWAHB Area Rep	Dr M Cuffe	Dr J Keenan
Dr Aideen Hayes	ECAHB Area Rep	Dr B Healy	Dr M Scollard
Dr Anne O'Neill	NAHB Area Rep	Dr M Ryan	Dr C Roe
Dr Mary O'Farrell	NEHB Area Rep	Dr D Quinn	Dr A Flynn
Dr Bridget Harrington-Barry	MHB Area Rep	Dr M O'Connor	Dr M Mulcahy
Dr Gerard Buckley	SHB Area Rep	Dr M Finn	Dr S Gibson
Dr Imelda Counihan	MWHB Area Rep	Dr M Houlihan	Dr M Keane
Dr Thomas Smyth	WHB Area Rep	Dr M Walshe	Dr P Costelloe
To Be Appointed	NWHB Area Rep		
Dr Marie Touhy	SEHB Area Rep	Dr B Lyons	Dr P Creedon
Dr Barney Murphy	Elected From Floor	Dr M Houlihan	Dr F Daly
Dr David Clarke	Elected From Floor	Dr B Murphy	Dr F O'Callaghan

It was noted that additional members can be co-opted on to the committee and that the Committee should consider the co-option of Dr Patrick Quinn at its first meeting.

Dr Barney Murphy seconded the motion, which was put to the floor and passed unanimously.

The outgoing President, Dr Margie Houlihan, in her valedictory address thanked her committee for its active participation throughout the past year and wished Dr Maeve O'Connor well for the next 12

months. She complimented Dr O'Connor on a most successful conference and noted the number of dentists who had commented on the high quality of lectures in the programme.

The new President, Dr Maeve O'Connor then thanked all health board dental surgeons for their attendance at the AGM.

HBDS President calls for increased dialogue on Health Reforms

Dr Maeve O'Connor, the Health Board Dental Surgeons Group's newly elected President, reveals the anxiety of her members desperate for more information about the Health Services Reforms, as she talks to Daniel Attwood at the 2004 HBDS Conference.

With well over half of the country's 325 health board dental surgeons attending the recent two-and-a-half-day Annual Conference in Connemara, the importance of the event, both from a professional development and a networking point of view, was clear. The conference had a range of high profile speakers who addressed the issues affecting the profession as a whole, as well as those specific to the sector. One speaker who highlighted the concerns of many members was Dr Jacinta McLoughlin who gave an overview of the Irish Health Service to date and what is known about the impending reforms — an issue that will directly affect all of those in attendance.

The HBDS Group, which is the second largest representative body within the IDA, will be instrumental in dealing with and negotiating on the most dramatic restructuring of the Irish Health Service ever. But, as Maeve O'Connor, who was elected President of the Group at the AGM, explains, with much of the negotiations still to take place, anxieties are growing. "Although the principles of the reforms have been outlined, there is still a lot to be worked out," she said. "We need clear planning and we need to be involved if resources are to be maximised."

Despite the slow rate of progress in the negotiations, a deadline of January 1, 2005, has been set for the abolishment of the health boards and the establishment of the National Health Service Executive. Maeve hopes the new HSE will speed the



negotiating process along and result in a better service for the patient. "We want to provide a fully comprehensive service. Our record to date is good, dental decay has been halved in the last 30 years, but we need more resources to give the public the service they deserve," explained the President.

There is also the major issue of attracting and retaining staff. As far back as 1978, the then Minister for Health, Charles Haughey, admitted that there was a shortage of dentists in the State. The government's website today advises that there is still a shortage of dentists and, therefore, health boards should give priority to certain groups. "The reforms should help by cutting down on red tape and increasing funding to make more posts available. Retention of staff is not a problem, it is a symptom," said Maeve. "We need investment in our current workforce,

notably with continuing dental education, vocational training and other support structures." In addition, human resource administration needs to be streamlined, and regular interviews and prompt payment of salary are all essential if the trend is to be reversed. "The result of no action in this area will put further strain on an already overburdened service, parents will become very frustrated that their children's health needs are not being met," warned the HBDS President.

The North South Survey of Children's Oral Health 2002 also highlighted areas that need addressing, such as the under-five-year-olds who have an increased decay rate compared to previous studies and the fact that more than two-thirds of 15-year-olds continue to have decay and trauma to teeth that has seen little change since 1984. "We want to be assured that resources are going to go where they are most needed. Good planning will be more effective and efficient in the long-term," said Maeve. "I am hopeful that the new Minister for Health, Mary Harney, will bring a fresh and logical approach to the Department. She comes with a reputation for getting the job done. We in the HBDS have always been open to any initiative that would help us to achieve an even better standard of oral health in this country. While a fully comprehensive service is our long term goal, in the short term, we need clearer guidelines on priority of services, so that they are fair and are seen to be fair countrywide."

Around the stands



On the PWS trade stand were Jim Mackie and Stuart Gill.



Representing Helsinn Birex were Brendan Fitzgerald and Claire Madigan.



3M was represented by David Graham.



On the Celtic Marketing (TePe) stand was Brian O'Shiel.



At Pfizer's stand were Niamh Lynch, Alannah McIntyre and Roseanne Dunne.



SDS Kerr was represented by Tommy Maguire.



Valerie Kiernan and Grainne Teefy represented Colgate.



On the Prestige stand was Alex Andersen.



Representing McCormack Dental were Shane O'Hanlon and Aidan McCormack



At GlaxoSmithKline's Sensodyne stand were Lorna Spillane and Louis O'Carroll.



Wyeth was represented by Sinead Corcoran and Aoife O'Keefe.



Pat Bolger, Nicola Kerr, Richard Kenny and John Rice all at Henry Schein stand.



John Harvey, Eamon Edmonds and Brian Rogers of Healthcare Waste Management Systems.



Joanne Tordoff and Grainne O'Gorman were representing Oral B.

social

The social side of the Health Board Dental Surgeons 2004 annual conference

The Journal of the Irish Dental Association takes a look at the relaxing side of the recent Health Board Dental Surgeons 2004 AGM. All photos courtesy of HANY MARZOUK.



Mike and Sue Clarke with the new HBDS Group President, Maeve O'Connor.



Orla Kirby, Rosarii McCafferty and Colette Kelly enjoying post conference drinks.



Barney Murphy, Frank Daly, Jim O'Denghe and Ed Russell discuss some of the main issues affecting the health board dental surgeons.



Robert Lewis takes a seat at one of the more unusual trade stands.



Antoinette Nolan, Mary Colman, Marie Tuohy and Moira Byrne relax and enjoy the social side of the annual conference.



Padraig Creedon, Frank Richter, Leo Burke and Tom O'Hehir catch up at the HBDS conference.

At the IAAGDS 2004 conference

The recent IAAGDS conference at Dublin's Helix was well attended by dentists and dental nurses from throughout Ireland. The JIDA captures some of the social side of the conference. All photos courtesy of BRIAN RYAN.



Eua Cratunoua, George Takla and GSK's Loran Spillmore at the GSK stand.



Prof June Nunn and JIDA Editor, Aisling O'Mahony at the recent IAAGDS conference at Dublin's Helix.



Marielle Blake and Alva Hope-Ross enjoy a relaxing break between lectures.



Anne Marie Lynch and Stephanie Caulfield enjoy a coffee at the conference.



John Canavan and Niall O'Connor at the Aesthetic Dental Care stand



Anne Gunderman, Ciaran O'Driscoll and Paul Quinlan relax between lectures.



Kevin Gilmore and Paul O'Reilly take in some of the trade stands at the IAAGDS conference.

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Locum required for dental practice in Dublin 2. For Jan, Feb, March 2005. Tel: 01-6787322 or 087-2322384.

Locum wanted for friendly west Cork dental practice. Four to six months from November 2004. Accommodation available. Tel: 028-31991 after 8pm.

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Locum required to cover maternity leave for practice in the southeast. Mid January 2005 to June 2005. Tel: 054-39283 after 6pm.

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Associate required for a practice based in the northeast England for very busy, friendly five surgery practice – modern, newly equipped premises. List to transfer with excellent earning potential. Lots of new patients. Mainly NHS. Hygienist, qualified and friendly support staff. OPG, IV and inhalation sedation. Fully computerised. The practice is easily accessible from the A1 and A19 by road and flights from Dublin to Teeside Airport, which is 10 minutes away. Tel: 0044-1642 677727. www.roseworthdental.co.uk and email: enquiries@roseworthdental.co.uk.

Locum – Suffolk, UK. Fully qualified dentist (BDS equivalent and full GDC registration) required for Christmas and New Year holiday period from 22 November 04 to 15 January 05 at group surgeries in Suffolk, UK. Duties will include all aspects of general dentistry and dealing with emergency admissions while resident dentists are on vacation. Salary £600pw. Contact William 0044-7785-380448 or 0044-1787-473874. Email: dutoit@stansteadhall.fsnet.co.uk

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Associate wanted part-time. Busy Navan, 2-surgery modern practice, hygienist. Monday, Thursday preferable – full-time 2005. References essential. Tel: Geraldine 046-9021348/9078936 or 087-6293496.

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miles from Dublin. Reply Box No. J404.001.

Oral surgeon wanted for sessional work in busy Dublin practice. Replies to Box No. J404.004.

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Diary of events

NORTH MUNSTER BRANCH, IDA

Annual Dinner

November 13, 2004

Dromoland Castle, Co Clare

METROPOLITAN BRANCH, IDA

Metropolitan Branch Christmas Party

November 20, 2004

Guinness Storehouse, Dublin

METROPOLITAN BRANCH, IDA

Open (Non Scientific) Evening

An Uncomplicated Christmas – J D'Anjou

What do you mean there is a fly in my soup – J Levin

December 2, 2004, 8pm

Westbury Hotel, Dublin

METROPOLITAN BRANCH, IDA

Annual Scientific Conference

Stress Busters

December 3, 2004, 9am.

Westbury Hotel, Dublin

IDA Annual General Meeting

December 4, 2004, 11am.

Jurys Hotel, Ballsbridge, Dublin.

METROPOLITAN BRANCH, IDA

Interdisciplinary Management of Hereditary Dental Disorders

January 20, 2005, 8pm. Berkeley Court Hotel, Ballsbridge, Dublin

54th International Alpine Dental Conference

Hotel Annapurna, Courchevel 1850, France

January 29 to February 5, 2005

For further information contact:

Robert Wallace, International Dental Foundation

METROPOLITAN BRANCH, IDA

Periodontal Systemic Disease Interface: Risk Profiling for the Periodontal Patient

February 17, 2005, 8pm. Berkeley Court Hotel, Ballsbridge, Dublin

IDA Annual Scientific Conference 2005

April 14 to 16, 2005

Great Southern Hotel Killarney, Co Kerry

IDS 2005 – 31st International Dental Show

April 12 to 16, 2005

Cologne, Germany

For further information see upcoming events on www.dentist.ie

Sixth International Orthodontic Congress & Third Meeting of the World Federation of Orthodontists

September 11 to 15, 2005

Paris, France

For further information see upcoming events on www.dentist.ie

www.nhsborders.org.uk 

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Winter 2004 quiz

BELOW: This painless lesion on the dorsum of the tongue was an incidental finding in the examination of a 42-year-old man.



Our thanks to
Eurocast Dental Lab
 East Wall Road, Dublin 3.
 sponsors of the Winter 2004 quiz

- What is the likely diagnosis?
- How can the diagnosis be confirmed?
- What are the risk factors for developing this lesion?
- What is the appropriate treatment?

Send your answers to:

Winter Quiz, The Journal of the Irish Dental Association,
 10 Richview Office Park, Clonskeagh Road, Dublin 14

Submitted by: **Dr Claire Healy** BDentSc, MB BCH BAO, FDS RCS (Eng), PhD
 Specialist Registrar in Oral Medicine, DDH and **Dr Stephen Flint** MA, PhD, MBBS, FDS
 RCS (Eng), FFD RCSI, FICD Senior Lecturer/Consultant in Oral Medicine, DDH.

Congratulations

The winner of the autumn quiz was:

Dr Rose-Marie Daly, Rathmines, Dublin 6

Her answer was:

Diagnosis: Dense Bony Islands

Treatment: No treatment required.

Radiology Case 3 answer

Radiological findings

There is a well-defined circular radiopacity below and not related to tooth #36. There is no peripheral radiolucency to the opacity. There is also a well-defined circular radiopacity over the root of tooth #44, with no peripheral radiolucency evident. A periapical radiograph (Fig 2) confirms the presence of the radiopacity and the lamina dura and ligament space on tooth #44 appear intact. Occlusal radiographs show the opacities within the mandible, lingually positioned to tooth #44 (fig 3) and buccally positioned to tooth #36 (fig 4).

Clinical Findings

There were no symptoms and no evidence of an exostosis, torus or hard bony swelling.

Interpretation

The appearances seen here are compatible with dense bone islands. The dense bone island (DBI) is a localised area of radiopacity in the tooth bearing area of the jaws, of unknown origin, and is not attributable to any other condition. DBIs are asymptomatic,

are usually discovered on a radiographic image made for some other reason and vary in their size, shape, outline, radiographic density and relationship to teeth. The common sites are the molar and premolar regions of the mandible and they are rare in the maxilla. DBIs may be separate from the teeth or blend with the lamina dura at or between the root apices. Root resorption may be seen in mandibular teeth, a reasonably rare feature. The majority of DBIs are single occurrences, but patients with two or three at the same time have been reported.

The term DBI is perhaps gaining some popularity, but common synonyms include idiopathic or focal osteosclerosis and enostosis. Less common terms in use include socket sclerosis, sclerotic bone, osteopetrosis, bone whorl, bone eburnation, bone scar and osteopetrotic scar. The term condensing or sclerosing osteitis has also been used. There is now some agreement that this term should be reserved for a lesion of inflammatory origin, as inflammatory osteitis is typically ill defined in its margin with the normal surrounding bone whereas DBIs are usually well defined and may be irregular in their outline. Variation in terminology can result in some confusion in interpretation.

Treatment

Some consider this to be a variation of normal trabecular pattern and no treatment is indicated, even in cases where resorption

of teeth is radiographically evident.

Differential diagnosis

The differential diagnosis of a radiopacity in the mandible might include:

- odontomes
- retained root or hypercementosed root
- periapical cemental dysplasia
- florid cemento osseous dysplasia
- fibrous dysplasia
- superimposed salivary stone
- mandibular torus
- exostosis
- osteoma
- conditions that contain calcified tissue (calcifying cysts/tumours).

A combination of:

- clinical examination to exclude tori and exostosis;
- history and mandibular occlusal images to exclude salivary stones;
- race, age and effect (or lack of) on lamina dura and ligament space; help to differentiate the various conditions. The majority of patients with DBIs have a single radiopacity. In patients with multiple radiopacities, one might also consider Gardener's Syndrome in the differential diagnosis. As all radiographic images are two dimensional, additional views from different directions may be appropriate to further investigate a particular condition.

References available on request