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The Maltese Dental Journal



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# Editorial

By Dr David Muscat

Dear colleagues,

This year Dr Nicholas Bezzina won the Master Chef trophy – a man of many talents, a chef as well as an excellent oral surgeon.

We mourn the loss of Dr Walter Debono, one of the nicest dentists of his generation. When he was well he would attend every single DAM event. A kind, considerate individual. May he rest in peace.

This year The Academy of Dental Excellence in conjunction with the University of Portsmouth Dental Academy is organising a three year 'MSC in Advanced Aesthetic and Restorative Dentistry' Course. The first two years will lead to a postgraduate Diploma. The final year will be the optional one year Masters top up at The University of Portsmouth. The lectures are online but the onsite workshops will

be held in Malta as well as the University of Portsmouth. If you are interested please contact the Academic Lead Dr Ann Meli Attard. on 70954656 or via email on info@root.mt. The programme Director is Professor Subir Banerji. The next intake is September 2024.

On 25 October 2024 Dr Ann Meli Atard in conjunction with Professor Banerji will hold a one day GC course on Injection Moulding for composite veneers at Cherubino premises.

On 1st November 2024 Dr Audrey Camilleri will hold a morning GC course on MIH at Cherubino premises.

Dr Audrey Camilleri has represented us in Athens at the CED conference. Dr Camilleri is also on the CED working group on Medical Devices. The DAM has made a great effort to provide a Medical emergencies course as well as the hands on element.

This course needs to be repeated ideally every two years. The feedback from this has been excellent.

Professor Arthur Cortes has lectured us on 'An Introduction to the Digital Workflow' and his father Dr Djalma Nogueira Cortes has lectured the ITI group on 'Management of Maxillary Sinus Operations.'

The ITI has two study groups in Malta. The Director is Dr Edward Sammut. Professor Arthur Cortes leads The Zirconium Group. It is a great idea to become an ITI member and join the ITI community.

The cover photo is of Vjal San Wistin Rabat and is by the artist Jacqui Agius.

David

Dr David Muscat B.D.S. (LON)  
Editor / Secretary, P.R.O. D.A.M.



Dr Nicholas Bezzina won the Master chef award on Sunday 5 May 2024



Professor Artur Cortes together with Dr Ann Meli Attard DAM CPD officer and Ms .Gaby Sultana Pro Health representative at the Palace Hotel Sliema where the lecture on digital Dentistry was held. This was an introductory lecture in digital Dentistry , involving the use of technologies such as imaging methods and computer-aided design and computer-aided manufacturing (CAD-CAM) to diagnose, plan and guiding the execution of dental treatments. The lecture covered the basic aspects and knowledge required for a dental surgeon to start working with digital work flows. The event was kindly sponsored by Pro Health.

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Dr David Muscat and Dr Audrey Camilleri, representing The Dental Profession, present a copy of The Dental Probe to Dr Roberta Metsola, President of The EU Parliament, on the occasion of the meeting of the Federation of Professional Associations with Dr Metsola at the federation building in Gzira. On this occasion, Dr Metsola met representatives of all the Federation Professionals.

Dr David Muscat editor of The Dental Probe presenting a copy of the Journal to Hon Dr Jo Etienne Abela Minister of Health and Active Ageing at the Ministry of Health, Valletta on the occasion of the meeting with the Medical Council of Malta. Dr Muscat is an elected dentist on The Medical Council of Malta.



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# GRANULAR CELL TUMOUR OF THE TONGUE

A case report by Anne Camilleri

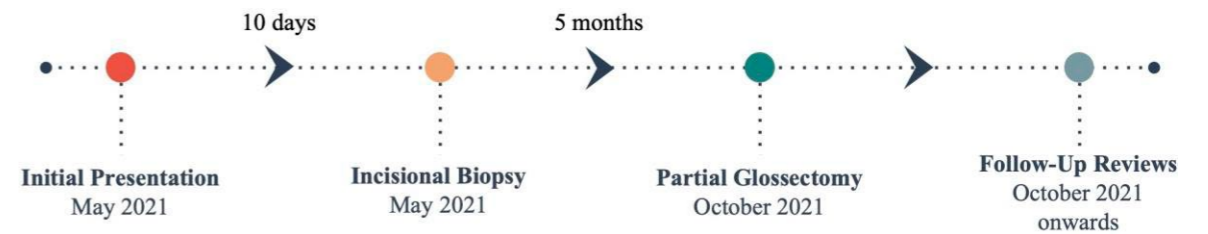


Figure 1 - Case Timeline

Figure 2 - Intraoperative Photographs

## HISTOPATHOLOGICAL REPORT – INCISIONAL BIOPSY

- Sections showing sheets and groups of large cells with uniform round to ovoid nuclei and abundant eosinophilic cytoplasm.
- The tumour extended from the superficial corium to the underlying skeletal muscle tissue, reaching the deep margin of the biopsy.
- Variable acanthosis in the overlying epithelium.
- Neutrophils noted in areas of the keratin layer, along with fungal hyphae identified with a PAS stain.
- Chronic inflammatory cell infiltrate seen focally in the underlying superficial corium.
- Immunohistochemistry showed strong diffuse expression of S100 protein and weaker expression of CD68 by the tumour cells, in keeping with granular cell tumour.
- Diagnosis: Mucosa, right posterior lateral border of tongue: Granular cell tumour with superimposed candidosis.



## ABSTRACT

A case report demonstrating the management of a granular cell tumour with focus on its diagnosis. A 48-year-old female patient presented with a raised, indurated, rounded, white lump of around 1.5cm diameter on the posterolateral aspect of the tongue. Histopathology and immunohistochemistry of an incisional biopsy revealed a benign granular cell tumour, which was treated with a partial glossectomy for complete surgical excision. The patient has shown no signs of recurrence since surgery. This report reaffirms the proposed neural origin of granular cell tumours and highlights the importance of correct diagnosis and distinction from other conditions.

## KEYWORDS

Granular cell tumour, Tongue, Partial glossectomy, Immunohistochemistry, Pseudoepitheliomatous hyperplasia

## LIST OF ABBREVIATIONS

- GCT Granular Cell Tumour
- GCTs Granular Cell Tumours
- WHO World Health Organisation
- PSE Pseudoepitheliomatous Hyperplasia
- OSCC Oral Squamous Cell Carcinoma
- PAS Periodic Acid-Schiff
- H & E Haematoxylin and Eosin

## CASE

A case of a forty-eight-year-old female from Gozo, Malta, managed for a granular cell tumour on the right lateral border of the tongue. The patient had a medical history of Hashimoto's thyroiditis managed with thyroxine. She did not smoke or consume alcohol. No relevant family history was reported.

In May of 2021 the patient attended the emergency department at the Gozo General Hospital due to an issue related to her thyroid. She was seen by a medical doctor who incidentally noted a white lesion on her tongue, of which the patient was not aware. The doctor referred her to the Gozo General Hospital dental department, where a dentist reported a raised, indurated, rounded, white lump of around 1.5cm diameter on the posterolateral aspect of the tongue. A diagnosis of granular cell tumour was determined from an incisional biopsy.

The lesion was treated by a partial glossectomy of the right side under general anaesthesia. It was completely excised using electrocautery. Tactile inspection by palpation was significantly relied on to detect presence of remaining tumour tissue intraoperatively.

The wound was covered with oxidised cellulose (Surgicel®) and sutured. The excised specimen measured 18mm superoinferiorly, 25mm anteroposteriorly, and 12mm in thickness. The histopathological report of the excised lesion corresponded with the earlier biopsy.

## OUTCOME AND FOLLOW-UP

The patient recovered very well without complications. Post-operative reviews were conducted daily following surgery until discharge.

Follow-up reviews were held monthly for the first year and every three months thereafter, including interval MRIs. No signs of GCT recurrence have been reported.

## DISCUSSION

A GCT is a relatively rare neoplastic lesion first described by Abrikosoff in 1926 as a granular cell myoblastoma originating from skeletal muscle.

This theory has been replaced by one of neuroectodermal derivation, as accepted by the WHO 2023 Classification of Head & Neck

Tumours. Specifically, GCTs are thought to be derived from Schwann cells (Rogala et al., 2022).

GCTs are usually solitary, but in a small number of cases (5-15%) multiple synchronous and metachronous lesions can develop (Becelli et al., 2001).

Continues on page 8

# GRANULAR CELL TUMOUR OF THE TONGUE

Continues from page 7

GCTs can occur at any submucosal or subcutaneous site of the body; those found in the head and neck region amount to 45%-65% of cases, 70% of which are intra-oral. The tongue is the commonest intraoral site for a GCT (Dhobley et al., 2013)

Oral GCTs are reported to show a female predilection (F:M = 3:1) with the reason being yet unknown. It may occur at any age with a mean in the fourth decade of life. (Dhobley et al., 2013). GCT has an incidence estimated at around 1:1,000,000 population per year (van de Loo et al., 2015). Black populations have been noted to have a higher incidence. (Nasser et al., 2011).

The pathology department at St Luke's Hospital in Malta reported 12 oral GCT cases, diagnosed between 1954 and 1997. The age range was 9 to 69 years and the F:M ratio was 1:1. Eight cases involved the tongue, making it the commonest site of occurrence within this sample. (Camilleri G.E., 2022)

While GCTs are usually benign, there have been malignant or locally aggressive cases and others with distant metastatic behaviour. Malignant cases account for 1-2% of all GCTs (Nasser et al., 2011).

A typical presentation in the oral cavity is a solitary, sessile, firm, well-defined, non-tender, and possibly nodular pink (or yellowish-white if near the surface) swelling which is smaller than 3cm. The overlying epithelium is usually intact but depapillation of the affected tongue surface may occur (Dhobley et



Figure 3 - Healed tongue 15 months after partial glossectomy.

al., 2013). As in this case, it is often an asymptomatic incidental finding. (Dias Ferraz et al., 2020).

## AETIOPATHOGENESIS

This is yet unknown (World Health Organization, 2023). Syndrome associations and genetic mutations have been investigated as possible pathogenetic mechanisms. Multiple GCTs are thought to be associated with LEOPARD syndrome, neurofibromatosis I, and Noonan syndrome (Castagna et al., 2017). Pareja et al suggested in 2018 that ATP6AP1 and ATP6AP2 mutations are pathognomonic for GCTs, since less than 0.3% of other common cancer types have the same mutation. The same study found a genotypic-phenotypic correlation between these genes and GCT.

Schwann cells have an established role in not only the development but also the repair of the peripheral nervous system after trauma. (Jessen & Mirsky, 2019). These Schwann cell pro-inflammatory mechanisms might be responsible for the granular aspect of the proliferating tumour

cells. (Lafuente Ibáñez de Mendoza et al., 2020). The abundant nerve fibres in the tongue, which are encased by Schwann cells, may be a potential source for development of GCTs (Dhobley et al., 2013).

## HISTOLOGY

The typical histopathological presentation of a GCT is a pseudo-invasive, non-encapsulated, submucosal neoplastic lesion, with tumour cells infiltrating through the connective tissue (Ferreira et al., 2017).

A proliferation of sheets of plump polygonal cells with abundant eosinophilic granular cytoplasm is characteristic (Lafuente Ibáñez de Mendoza et al., 2020), as seen in this case. Descriptions of nuclei vary from small and eccentrically located nuclei (Sena Costa, Bertini, Carvalho, Almeida, & Rodrigues Cavalcante, 2012) to centrally-positioned nuclei (Qureshi et al., 2006), and appearance ranges from dark and hyperchromatic to pale and vesicular (Vered et al., 2008). In this case the nuclei are seen as uniform and round to ovoid.

## Pseudoepitheliomatous Hyperplasia

Up to 50% of oral GCT cases exhibit pseudoepitheliomatous hyperplasia (Ferreira et al., 2017). This is thought to be brought about by an interaction between the granular cells and the neighbouring epithelial cells which stimulates basal cell proliferation. (Vered et al., 2008).

PEH is more common in cases involving the tongue, and in fact our case records the presence of PEH in both biopsy reports. Cases with pronounced PEH can mimic a well-differentiated squamous cell carcinoma and are at risk of a false diagnosis.

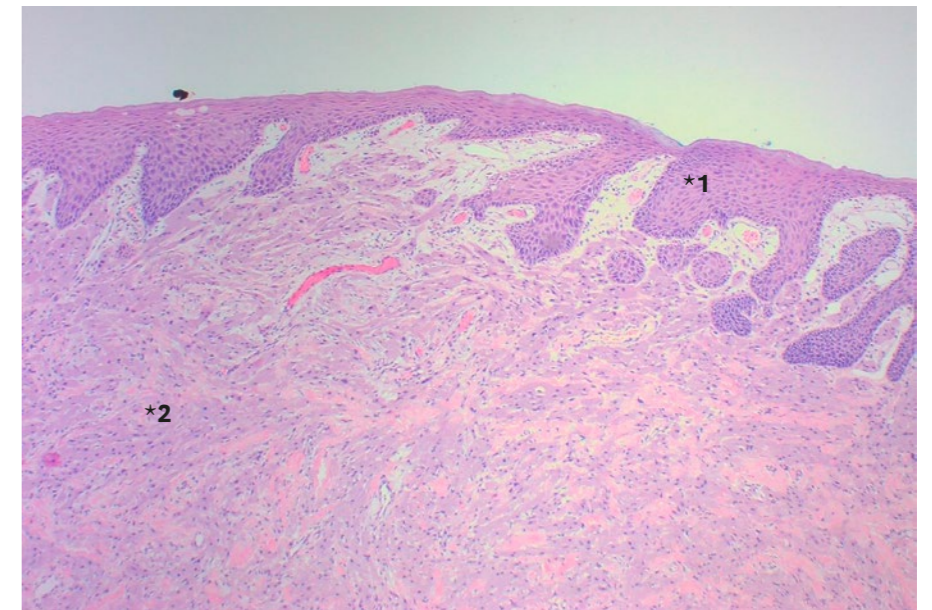
This risk is higher if the incisional biopsy is too small and/or superficial, involving the epithelial surface only and excluding clear definition of the characteristic granular cells of GCT (Sena Costa et al., 2012). This justifies an extensive biopsy of GCT to ensure detection of the granular cells (Lafuente Ibáñez de Mendoza et al., 2020).

Absence of histological signs of malignancy (necrosis, pleomorphism, high mitotic index, cellular atypia) exclude OSCC. If the lesion presents with granular cells overlain by a surface which is carcinoma-like, it should be considered a benign, reactive change. As of yet, there is no association between GCT and true squamous cancer (Dhobley et al., 2013).

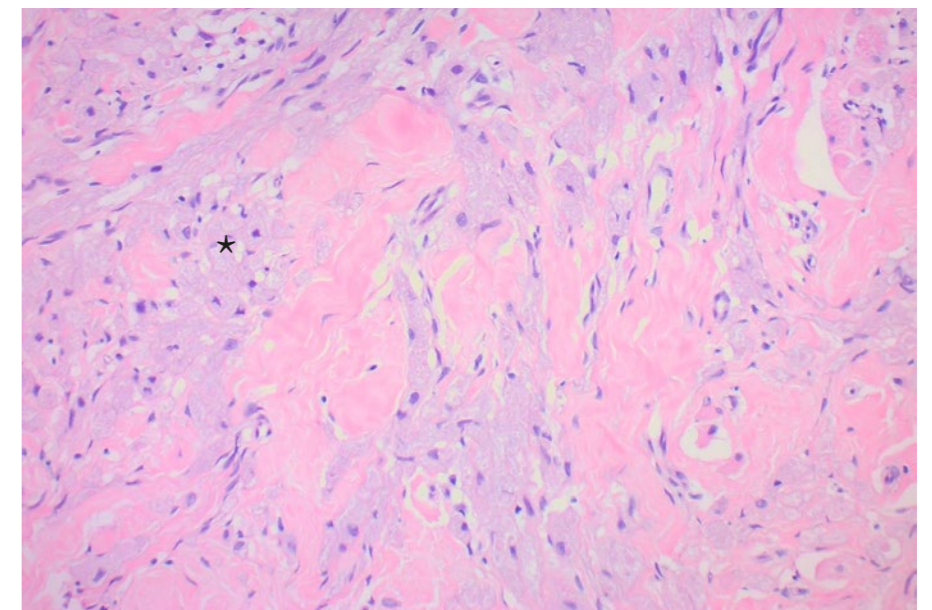
## Immunohistochemistry

This case was analysed with two immunohistochemical markers – S100 and CD68. A positive response to both is observed.

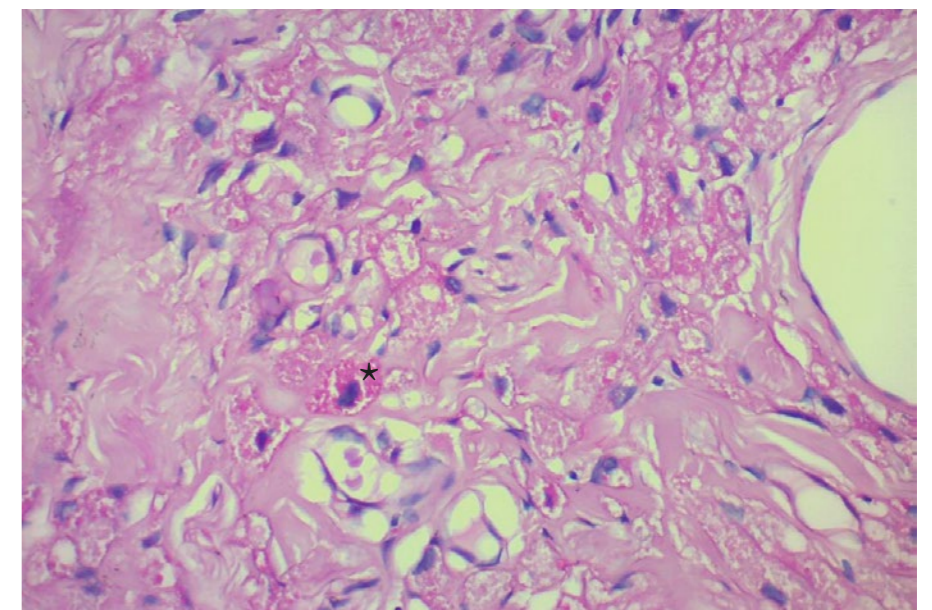
GCTs respond strongly and consistently to the S100 protein, and in fact this reaction is often considered a diagnostic requirement (Vered et al., 2009). This marker is typically found in glial cells, granule cells, and Schwann cells, thus supporting the theory of neural origin of GCTs (Sena Costa et al., 2012).



Excisional Biopsy Histology Slide: Figure 3 - Low power view displaying mucosa covered by parakeratinised stratified squamous epithelium showing pseudoepitheliomatous hyperplasia (\*1) with underlying tumour (\*2). H & E stain, original magnification x100.



Excisional Biopsy Histology Slide: Figure 4 - High power view showing tumour cells (\*) with small uniform nuclei and abundant granular cytoplasm in the connective tissue of the corium. H & E stain, original magnification x200.



Excisional Biopsy Histology Slide: Figure 5 - High power view showing PAS positive granules within the tumour cells (\*). Original magnification x200.

Continues on page 10

# GRANULAR CELL TUMOUR OF THE TONGUE

Continues from page 9

Other histological features that further demonstrate GCT neural origin are its close anatomical relationship to peripheral nerve fibres and the presence of axon-like structures, myelin figures in GCT ultrastructure, and immunohistochemical reactivity with neuron-specific enolase and myelin proteins (Dhobley et al., 2013).

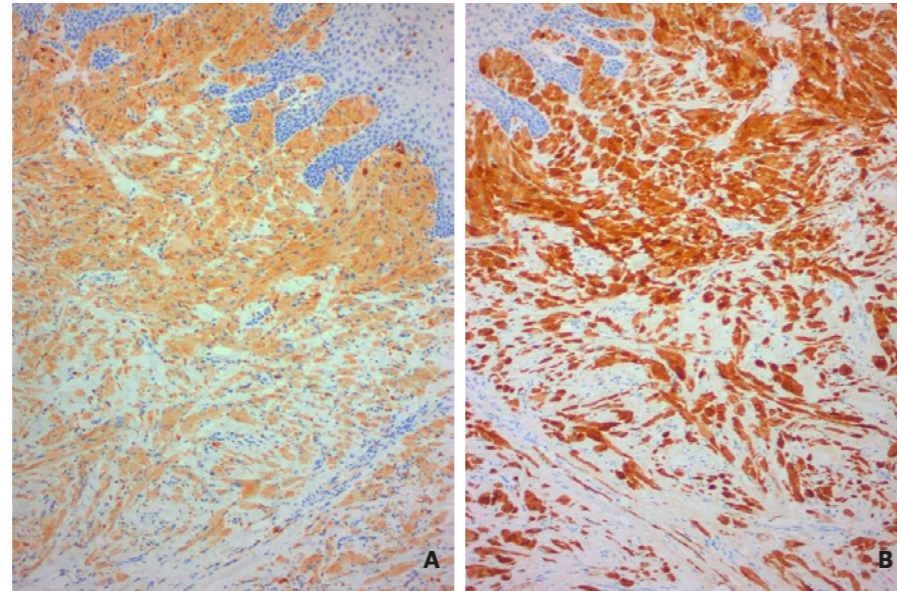
## TREATMENT

Conservative excision is the treatment of choice for oral GCTs. The lack of encapsulation implies poorly-differentiated margins, making complete surgical excision more difficult and recurrence more likely. For this reason, a clear surgical margin of sufficient width is indicated. (Musha et al., 2018). To ensure complete tumour removal, surgical margins should be into the adjacent normal tissues (Garcia-Rejas et al., 2011).

In this case the lesion was excised with a surgical margin of 8mm, however histologically it extended very close to one aspect of the margin, heightening the importance of follow-up reviews to assess recurrence.

## PROGNOSIS AND RECURRENCE

The prognosis of benign GCT is good, with complete excision being curative. According to Fanburg-Smith, Meis-Kindblom, Fante, & Kindblom, 1998, benign lesions have a recurrence rate of 2-8%, even with margins deemed lacking tumour infiltration. In cases of margins positive for tumour, the recurrence rate is around 20% (Fanburg-Smith et al., 1998).



Excisional Biopsy Histology Slide: Figure 6 - Immunohistochemistry showing strong diffuse expression of S100 protein (A) and CD68 (B) by the tumour cells. Original magnification x100.

## COMPLICATIONS

While this patient did not suffer any significant complications, certain risks are associated with GCTs and their surgical management:

The patient was made aware of these risks before intervention and gave informed consent.

## TABLE 1 - POSSIBLE COMPLICATIONS OF GCT AND ITS TREATMENT

Local invasion and tissue destruction
Lingual nerve trauma causing temporary/permanent dysaesthesia/paraesthesia
Surgical site infection
Dysphagia
Dysarthria
Poor aesthetics
Tumour recurrence

## DIFFERENTIAL DIAGNOSES

From a clinical standpoint, this case had several differential diagnoses apart from GCT which were eliminated by histomorphological differentiation with immunohistochemical aid.

These range from benign tumours of connective tissue to their malignant counterparts, as well as oral carcinomas and minor salivary gland tumours.

## CONCLUSION

Granular cell tumour is a rare condition requiring histological evidence for definitive diagnosis. Treatment is surgical excision with wide margins and follow-up is important to monitor recurrence.

This report highlights the importance of the relationship between clinical, histological, and

## TABLE 2 - DIFFERENTIAL DIAGNOSIS OF GRANULAR CELL TUMOUR

Lipoma
Fibroma
Neurofibroma
Granular cell leiomyoma
Oral squamous cell carcinoma
Malignant granular cell tumour
Non-neural granular cell tumour (S100-negative)
Fibrosarcoma
Basal cell carcinoma
Alveolar soft part sarcoma
Leiomyosarcoma
Minor salivary gland tumour

immunohistochemical aspects, for the establishment of the correct diagnosis of GCT. Granular cells are essential diagnostic criteria, while S100 positive response and pseudoepitheliomatous hyperplasia may be confirmatory. Immunohistochemical analysis substantiates the neural histogenesis of GCT and histopathology demonstrates the possible association with PEH.

A study on the incidence, clinical, and histological features of GCT in Malta with follow-up studies on possible recurrences is a worthwhile project. ■

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# AN AUDIT TO EVALUATE THE AGE WHEN PATIENTS WITH IMPACTED MAXILLARY CANINES ARE REFERRED FOR SPECIALIST TREATMENT

Dr Natasha Zarb B.Ch.D. (Melit.), MFDS RCSEd, P.G.Cert. (Melit.), M.Sc. (Melit.)

Higher Specialist Trainee in Orthodontics, Dental Department, Mater Dei Hospital

## INTRODUCTION

Teeth erupt symmetrically, in a well-defined timescale and sequence. Any tooth whose eruption is delayed by more than 6 months after its opposite number, where it is delayed such that the next tooth, or in bilateral cases, the next pair of teeth erupt before, should be investigated. Early referral provides the opportunity for some improvement to be made in the position of palatal canines without surgical intervention.

## AIM

To compare current practice with guidelines of the Royal College of Surgeons for the age at which patients with an ectopic palatal canine are first referred to an orthodontist.

## STANDARD

The standard set by the Royal College of Surgeons of England states that all patients with an impacted canine should be referred by 12 years of age (1).

## METHODOLOGY

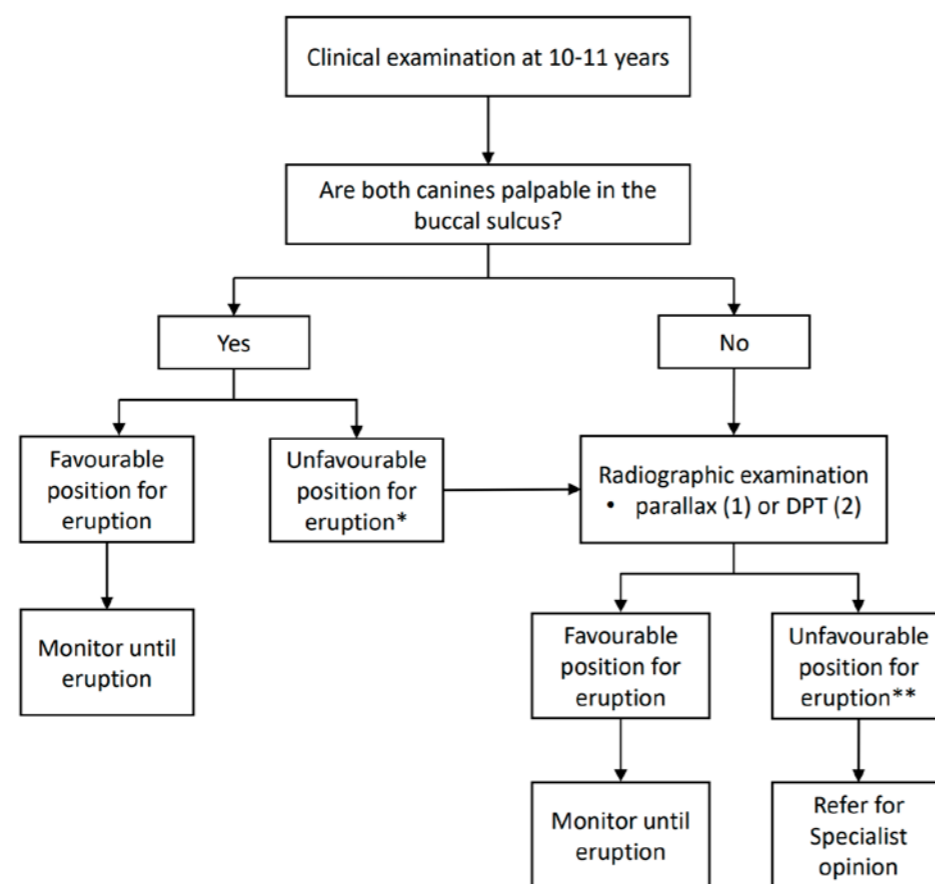
Referral letters to the Orthodontic Unit, Dental Department, Mater Dei Hospital were used for data collection. The sample size was 494 orthodontic referrals available from January to December of the year 2019. The percentage of referrals that met this criterion was identified.

## RESULTS

5.9% of Orthodontic referrals to this Department during 2019 concerned ectopic maxillary canines. 52% of patients with ectopic maxillary canines were referred late (>12 years) at a mean age of 14.3 years.

## CONCLUSION

Timing of referral for impacted maxillary canines fell short of the required standards. 📌



\*Clinical features associated with impacted maxillary canines:

- Non-palpable buccal canine bulge
- Presence of a non-mobile retained deciduous canine
- Abnormal position or appearance of adjacent teeth

\*\*Radiographic features associated with impacted maxillary canines:

- Abnormal position or appearance of the permanent maxillary canine
- Lack of resorption of retained deciduous canine root
- Abnormal position or appearance of adjacent teeth

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# MEDICAL EMERGENCIES IN DENTISTRY

A Presentation by Dr Adam Bartolo  
Summarised by Dr David Muscat

## IMPLEMENT RISK MANAGEMENT STRATEGY

Emergency drugs  
Collapsed victim  
Basic Life support  
External Defibrillator  
Identify medical emergencies  
Work as a dental team

80% of Medical emergencies occur during dental treatment so it is important not to leave the patient unattended.

15% of other emergencies occur elsewhere in the practice. One must always have a master key for the toilets or a safety lock.

5% of emergencies happen after the patient leaves.

Faint/hypoglycaemia/angina/epilepsy/choking/asthma/anaphylaxis / Myocardial infarction/cardiac arrest.

## CARDIAC ARREST

One occurs every 45 seconds in the world. Bystander CPR important. Early resuscitation and prompt de fibrillation.

## RISK MANAGEMENT STRATEGY

Take a very good MH. Apply an alerting system to the clinical records if there is a known risk. (tag in software or pop-up or a sticker on the card.) Be knowledgeable about high risk medical conditions and their pharmacological management.

Important to have a BNF. Know the principles for the prevention and management of medical emergencies.

Be familiar with working environment. Practice management MEs with team. Division of labour.

Everyone knows their role. Check equipment functionality and log it (eg senior DSA). Check drug expiry dates and log it.

## EMERGENCY DRUGS

**Glucose Oral Gel**  
Hypoglycaemia. Use conscious diabetics.admin. Orally.

**Salbutamol**  
100 micrograms. Bronchodilator. Admin orally via a spacer device.

**Glyceril Trinitrate Spray**  
400 micrograms .angina. Under tongue.

**Aspirin Tablets**  
300mg. Myocardial infarction. (alka Seltzer 325mg).orally

**Adrenaline - Prefilled Syringes. 1 in 10mls. (1:10,000)**  
Adrenaline minijet. YOU GIVE 500 MICROGRAMS TO GIVE 500M MILLILITRES.) anaphylaxis.IM very slowly.

**Adrenaline Ampoules 1mg in 1ml. (1:1000)**  
ANAPHYLAXIS . IM VERY SLOWLY. HYDROCORTISONE SODIUM

## SUCCINATE POWDER FOR INJECTION.

This comes as a vial powder. You need a syringe and sterile water. You inject the vial ,mix and aspirate back.You mix with 2mls of sterile water for injections.

Used for status Asthmaticus, anaphylaxis and adrenal crises.

**Chlorpheniramine**  
hypoglycaemia IM

**Glucagon**  
hypoglycaemia -KEPT IN TH FRIDGE 1MG WITH 1ML DILUTION.

**Midazolam**  
Epilepsy 10mg in 5mls. Can give IM or IV.THIS IS KEPT IN A LOCKED CUPBOARD.

**Flumezenil Ampoules. 0.5mg In 5mls.**  
This is used for reversal of sedation effects of benzodiazepines.

## EQUIPMENT

Disposable hypodermic syringes 2ml-5ml with 21g needles.  
Pulse Oximeter  
Pocket Mask -with/ without oxygen inlet.  
Medical Oxygen

## EMERGENCY EQUIPMENT

Automated defibrillator  
Self inflatable respiratory bag  
Oropharyngeal airway  
Iv cannula 16G,20G  
Aspirator.



## OXYGEN TO PATIENT

Patient has to be breathing Ventilating a patient. Regulator - to make it breathable Flow meter -to adjust the flow. Attach an oxygen mask with a tube. Patient only gets 50% of what the regulator shows as the patient exhales and so dilutes what is marked with expired air.- the flows don't match. The body breathes in cycles-the breathing bag boosts this.

## POCKET MASK WITH A ONE WAY VALVE.

## AMBU BAG FOR VENTILATION

Comes with own face masks.The bag is self inflating but first you have to deal with the airway. Mouth to mask.

## A is for AIRWAY

## B is for BREATHING

## UNRESPONSIVE AND ABSENT ABNORMAL BREATHING

CALL EMERGENCY SERVICES

GIVE 30 CHEST COMPRESSIONS

GIVE 2 RESCUE BREATHS

CONTINUE CPR 30:2 AS SOON AS AED ARRIVES SWITCH IT ON AND FOLLOW INSTRUCTIONS

CHECK RESPONSE TO 'ARE YOU ALL RIGHT?' IF RESPONDS,LEAVE AS YOU FIND HIM REASSURE REGULATE

R THEY BREATHING? HEAD TILT-CHIN TILT 2 FINGERS ON THE BONY PARY OF THE FRONT OF THE MANDIBLE FOR MORE THAN 10 SECONDS LOOK LISTEN FEEL

ABNORMAL BREATHING -agonised gasping occurs after heart stops in up to 40% of cardiac arrests. Described as heavy,noisy or gasping breathing.

## C – CALL 112

IMPORTANT TO NOT HANG UP AND ADVISE OPERATOR WHERE YOU ARE.PUT ON SPEAKER

PHONE AND START CPR.

## C is also for Circulation and Chest Compressions.

Place heel of one hand in the centre of the chest. Place the other hand on top. Interlock fingers, ensure that the pressure is not applied over the victims ribs. Compress the chest

Rate 100-120 /min  
Depth 5-6 cms  
Equal compressions

Give 30m compressions 2 per second PROCEDURE

2 RESCUE BREATHS HEAD TILT/CHIN TILT PINCH SOFT PART OF THE NOSE TAKE NORMAL BREATH PLACE LIPS OVER MOUTH BLOW INTO CHEST ONE SECOND ALLOW CHEST TO INFLATE REPEAT ONE RESCUE BREATH DO NOT INTERRUPT CHEST COMPRESSIONS FOR 10 SECONDS

30:2 REPEAT CYCLE

## 3RD LINK

BLS will keep the patient alive until you get the defibrillator . Some AEDS actually switch themselves on when opened. Follow voice prompts. Power button -check it is on. Attach the pads-tear envelope Stick on the chest.Shock across the heart.. The one on the right under the clavicle

The one on the left below the heart. Remove jewellery. May need to shave if hairy chest. Skin will be sweaty and skin dry. Stand clear during the analysis. Deliver the shock safely The machine will arm itself – if you press the button it will shock instantly.

Continues on page 16



# MEDICAL EMERGENCIES IN DENTISTRY

Continues from page 15

Keep everyone away.  
This is a critical point as it may electrocute others.  
After 2 minutes will reassess to see if patient needs another shock. If no shock is advised, reanimate, pulse and heartbeat.

PLEASE NOTE THAT NOT ALL CARDIAC ARRESTS ARE AMENABLE TO DEFIBRILLATION – AT SIGN OF LIFE place in recovery position until emergency services arrive.

## OPTIONAL – CAROTID PULSE CHECK

## USE OF OXYGEN

If you are going to supplement oxygen you need to move one metre from defibrillator.  
First start BLS algorithm  
2nd call 112  
If breathing or not  
Send for AED  
Carry on chest compressions whilst attaching AED pads

If you are using an AMBU bag one person will be exclusively at 12 o

Clock with the patient in head-tilt/ chin-lift with a mask on the patient. Alternative give CPR every 2 minutes.

WITH BLS FOR CHILDREN ALWAYS EMPHASIS ON COMPRESSIONS. V RARE CARDIAC ARREST KIDS NEED VENTILATION ASAP. 5 RESCUE BREATHS CPR 30:2

## AED IN CHILDREN

Over 8 years treat as adults  
1-8 years paediatric setting  
Less than one year use paediatric pads/ settings.  
With children you use on pad on the front on chest and one pad at the back - so shock goes across the heart.

## DROWNING

SAME -BUT WITH 5 BREATHS AND 30 CHEST COMPRESSIONS

## VASOVAGAL ATTACK -FAINTING . RAISE LEGS

## ANGINA PECTORIS

Chest pain,shortness of breath, GTN relief in 3 minutes

The GTN dilates the coronary arteries. In Myocardial infarction the heart is deprived of oxygen. An infarct is irreversible and the muscle will die eventually and be replaced by skeletal muscle.

This shows on an ECG. An infarct does not imply a cardiac arrest. A heart may still function with a small infarct.

Continues on page 19



Several practical hands on BLS sessions were held at The Prince of Wales Band Club in Vittoriosa with the collaboration of the DAM and The European Resuscitation Council. Emergency Lifesaving scenarios were rehearsed with the use of a manikin, ambu breathing bag and mask as well as a defibrillator. Drs Adam Bartolo, Nicholas Busuttil, Dougall and Ann Meli Attard are all registered trainers and taught at these events.

new

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# MEDICAL EMERGENCIES IN DENTISTRY

Continues from page 16

## MYOCARDIAL INFARCTION

A severe crushing pain in the central area of the chest.  
Pale clammy skin  
Nausea and vomiting  
Pulse weak and BP falls  
Shortness of breath  
Give GTN

## MANAGEMENT

Put in a comfortable position.  
Maintain the airway.  
Phone 112  
Give GTN  
Give high flow oxygen  
Reassure the patient to relieve further anxiety  
Give aspirin 300mg  
Give inhalation sedation nitrous /oxygen .analyse /calm  
If unresponsive-check breathing and circulation  
Start CPR in the absence of signs of life or normal breathing(ignore occasional gasps)

## CARDIAC ARREST

Causes; Myocardial infarction  
Hypertension  
Hypoxia  
Anaphylactic shock

Put patient down -testing vasovagal, plus 1st stage management cardiac arrest.

SUDDEN CARDIAC ARREST  
-BLS /CPR PROTOCOL

**SILENT MI – FULL BLOWN HEART ATTACK WITH NO CHEST PAIN – THIS HAPPENS IN DIABETES.**

## STROKE

## CVA CEREBROVASCULAR ACCIDENT

Rupture or thrombosis of a cerebral blood vessel. Signs -sudden  
Weakness/slurred speech  
Heavy limbs  
Loss consciousness  
Maybe vomit/convulsions/headache  
Action- BLS protocol  
Recovery position  
Oxygen  
Arrange transfer to hospital  
Begin CPR

## CHOKING

This is a killer/ Get them to cough - stay with them.  
Up to 5 back blows with palm of the hand or else abdominal; thrusts.  
The fist is directed inwards and upwards -the Heimlich manoeuvre (abdominal thrust manoeuvre)

## ASTHMA

Poorly controlled pre existing condition,anxiety,infection,exercise,exposure to an antigen.

- Those who are on heavy medication -steroids and bronchodilator (brown and blue). some also take steroid tablets.
- Or those who are not compliant with their medication.The steroids are long term and if taken properly the patient will not really need the bronchodilator -which is short term .
- Moderate asthma -gasping ,wheezing or coughing. respiratory rate of less than 25 breaths /minute. Heart rate less than 110 breaths /minute.

Acute severe asthma- respiratory rate greater than or equal to 25 breaths /minute  
Tachycardia greater than or equal to 110 beats /minute.  
The heart is beating faster as a compensatory mechanism.



Life threatening asthma -limits of survival.Silent chests,cyanosis,feeble respiratory effort,less than 8 breaths in one minute,hypotension,dysrhythmia or bradycardia.-less than 50 beats per minute.  
Exhaustion, confusion, decreased consciousness or coma.

Treat; identify - puffs bronchodilator with a large space volume device. Repeat dose 10-20 puffs. High flow oxygen . Use passive mask with oxygen. Salbutamol nebuliser solution mix 50/50 saline and vaporise the solution.

If there is no improvement eg inability to complete a sentence call 122  
Hydrocortisone sodium succinate 100-200 mg IM  
High flow oxygen  
4-6 puffs B2 Broncodilator through large volume space device for 10 minutes

If unresponsive give BLS/ CPR protocol.

Continues on page 20

# MEDICAL EMERGENCIES IN DENTISTRY

Continues from page 19

## ANAPHYLACTIC SHOCK

Cause – severe allergic reaction to foreign substance once it starts it rapidly progresses. Urticaria, itching. Abdominal pain, vomiting, diarrhoea, sense of impending doom. Flushing, pallor Laryngeal oedema /bronco-spasm -may develop stridor and wheezing. Respiratory arrest leading to cardiac arrest. Vasodilation causing relative hypovolaemia. The vasodilation occurs everywhere leading to low blood pressure and collapse and the heart will struggle to pump.

## MANAGEMENT

Lie patient flat and elevate the legs to restore bp. Give high flow oxygen Immediate slow IM adrenaline admin 300-500 micrograms (3-5mls adrenaline injected in 10 mls) 1;10.000 pre filled ready to use syringe /or patient auto injection in those patients known to have severe reactions may prevent the situation from worsening. Then dial 112

The 500 micrograms adrenaline can be repeated if necessary at 5 minute intervals. Do not inject fast . If less severe one may give salbutamol Chlorpheniramine 10-20 mg IM Hydrocortisone sodium succinate 100-200 mg IM If unresponsive check signs of life Start CPR

## HYPOGLYCAEMIA

Low blood sugar. Cause is excess of insulin due to low blood sugar . stress fever.

## EPILEPSY

Aura Sudden loss of consciousness Rigid, falls After few seconds ,jerking movements Tongue may be bitten (clonic phase) Frothing mouth Urinary incontinence Lasts few minutes Patient may become floppy but remain unconscious. After a time will regain consciousness but may remain confused.

## EPILEPTIC FIT

Differential diagnosis. Fits may be a sign of hypo glycaemia esp diabetes and in children

Early glucose measurement is important.

Check for presence of a very slow heart rate (less than 40 per minute) which may drop the blood pressure. This is usually caused by a vasovagal episode. The drop in blood pressure may cause a transient cerebral hypoxia and result in a fit.

## A SIMPLE FAINT

Head down / feet up

With epileptic fits move items of the way.Do not put anything in the mouth tom stop it from closing . Do not restrain. Check blood level to exclude hypoglycaemia -(if less than 3mmol litre ) if possible !! If seizures are prolonged and convulsive movements last more than 5 minutes then this is a status epilepticus .dial 112. consider Midazolam a single dose by slow IM injection.

Adults and child over 10 years 10mg Child 5-10 years 7.5mg Child 1-5 years 5mg One must refer if Status Epilepticus, or this is a first episode or there is a high risk of recurrence or patient is unstable or it is difficult to monitor the patients condition. 🚑



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# THE VOCO CPD EVENT IN CUXHAVEN

Summarised by Dr David Muscat

On 18/19 April 2024 eight dentists attended a two day course at the HQ of Voco Germany.

The course featured lectures by Dr Peter Hoffmann( a dentist as well as a technician). The lectures featured Orcomer -based restorative materials followed by hands on sessions .

There was a factory tour, including the product work-flow system from A to Z such as research and development,testing, raw materials, production, packaging and work ethics.

There were lectures on luting of indirect restorations and on how to use glass fibre posts and posts with glass fibre stands.

There was another hands on session where the dentists used Admira Fusion, Futurabond U, Bifix, Rebuild Posts and Rebuild DC. Comparisons were made with other materials from other companies and research was presented with the positives and negatives

There was also a lecture on Grand TEC glass fibre and its various uses for replacing teeth immediately at the chairside..

There was also a lecture and hands on using heated composites. VisCalor composites and the VisCalor dispenser were used. The Voco caps warmer allows brief warming up of composites. Heating composites improves handling as they have a lower viscosity which makes the material more flowable so thick composites may be extruded more easily from the compule.



This increase ergonomics and reduces hand and finger fatigue.

Voco have a state of the art hands on facility . The company has a very good relationship with its workers and the company provides a creche for the children of the workers as well as Friday afternoons off for everyone so they may spend time with their families. In addition on Fridays workers are treated to a slap up breakfast as a treat besides a daily lunch. The company employs 400 workers in the Cuxhaven branch alone. The company is represented worldwide. In America there are different specifications that are catered for. Everyone we came across smiled and looked very happy .We were made most welcome. The emphasis is on quality not quantity.

## ORCOMERS

The resin is inorganic and a methacrylate. There are many double

bonds at the end of a chain. The Orcomer is the methacrylate resin.. It s a new inorganic resin monomer based on silicon dioxide. There is an elimination of the classic organic resin monomer so there is low shrinkage and no residual monomers after shrinkage.Gas chromatography has been used to check for residual monomers left after curing. Residual monomers may cause allergies if left.

Admira Fusion is one such Orcomer and this is used for direct fillings and has strongly improved bio compatibility. There is no exposition of Bis Phenol A. Manufactures try to avoid Bis Phenol A.

There is a shrinkage of up to or less than 1.25%.The filler particles are silicon oxide so there is a strongly improved tolerance of this material.Admira Fusion consists of 84% inorganic fillers .

You light cure a radio-opaque nanohybrid Orcomer restoration.



## COMPOSITES

Grandio is a universal nono-hybrd composite material This is used for anteriors as more translucent. Grandioso has 89% filler and has outstanding wear resistance and low shrinkage.This is better for posteriors as more opaque.

Maximum 2mm increments. Check depth of cavity with a probe.

With FuturaBond you will get 50 Mega Pascals of bonding.

There is a new shade =t his is GA 3.25.

## CERAMICS

Ceramics and porcelain have the same base. If there is less than 3% kaolin it is porcelain. If there is more than 3 5 kaolin it is ceramic.

Vita colours were based on porcelain teeth for dentures (vita ceramic teeth). One needs a background

of a neutral grey card to have a neutral grey colour. You need to take out the sample tooth and turn it around on a neutral background.

## OTHER COMPOSITES

For 2mm layering one may use Admira Fusion, Admira Fusion Flow, Admira fusion 5 Nano.

For 4mm bulk fill one may use Admira fusion X tra and Admira fusion X Base.

## THE C FACTOR

When you change a class 2 to a class 1 during a restoration you have a configuration factor increase as now you have a closed chamber. Increments have to be of 2mm and light cure properly.

Admira Fusion is a universal packable restorative in cluster shades. Used for class 1-4., decayed anteriors, core build ups

,composite inlays and has 84% filler with 1.25% shrinkage.

Admira Fusion Flow is a flowable restoration with 2mm increments and small cavities class 3-4. it is used to lute translucent prosthesis and has 75% filler and a 2.75% shrinkage.

Admira fusion X Base is a packable bulk fill restoration packable up to 4mm and can be used for Class 1,2,5 and as abase in class 1 and 2. It has 84% filler and shrinkage is 1.25%. It is also used for core build ups and extended fissure sealing as well as the repair of small enamel defects ..

## BONDING

An adhesive and a composite are not the same. You cannot use a flowable instead of an adhesive. Exposed collagen fibres are replaced by adhesive monomers.

Continues on page 24

# THE VOCO CPD EVENT IN CUXHAVEN

Continues from page 23

When using phosphate cement as an adhesive - it is important to have a wetting performance and a rough surface. When you cut the preparation you need to leave the surface rough.

Cut with a diamond ISO 524. For finishing use a ISO 504. the tungsten carbide ISO 072 can be used but only on human dentine not on composite cores. Do NOT use a tungsten carbide if you wish to leave a rough surface for luting as it is too smooth for adhesive work.

Phosphoric acid is 32-37% and this must be washed off for 30 seconds. Litmus paper tests have been carried out where it has been shown that some dentists do not wash off all the acid.

## MTA

Leave the pulp untouched even if there is caries. MTA is very healing friendly. MTA makes a difference in the surface.

Bio Dentine is a class 3 Medical product and this means that it has to undergo many stringent animal and clinical tests so this makes it very expensive.

Adhesives should be placed in the fridge at 8 degrees. Adhesive monomers are altered by temperature and every time you open the bottle you let out alcohol. Futura bond is individually packed. With this you do not need to etch in addition. The universal Futura bond self etch is the 7th generation etch/prime/bond and is universal to all dental materials.

## ZINC OXIDE/EUGENOL

Eugenol penetrates the dentinal tubules. There is a problem with hand mixing as if you add too much liquid you will have too much eugenol and this has a certain pseudo toxicity and causes inflammation and allergic reactions when eugenol levels are increased.

## LUTING OF DENTAL RESTORATIONS

There must be no voids or bubbles.

With Zinc oxide luting is tricky as it does not stick to metals. Use to stick gold, palladium based alloys, non precious alloys, titanium.

Continues on page 26

## PAYMENT FORM

### NAME:

Dr

### Registration Number Medical Council:

Cheques are to be payable to the Dental Association of Malta. Please note that membership renewals received after 1st July 2024 will incur an additional 25 euro administrative fee.

### PAY:

#### Dental Association Of Malta,

Villino San Antonio, Triq il-Bahar l-Iswed,  
St Julian's STJ 1853

**Bank account:** 4002375181-7 DENTAL ASSOCIATION OF MALTA

**IBAN:** MT54 VALL 2201 3000 0000 4002 3751 817

**Bank's BIC:** VALLMTMT

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# THE VOCO CPD EVENT IN CUXHAVEN

Continues from page 24

Ceramics are passive inert materials so surface conditioning is mandatory. Hydrofluoric Acid roughens the surface of the ceramic. It is important to use a silane for successful luting.

Ceramics - feldspar, leucite reinforced glass ceramics, zirconia and aluminium oxide ceramics. Lithium disilicate differs in chemistry to aluminium oxide ceramics. Feldspar works the same and is much cheaper than lithium disilicate.

Do NOT use glass ionomer with zirconium luting - use phosphate cement. The reason is that glass ionomer shrinks and may lead to trouble. The values of shrinkage are hard to find. Luting to dentine is good with GI but not to Zirconia..

Cerec restorations require a spacer- you determine the gap for the luting restoration. Phosphate cement requires a minimum spacer.

The composite resin cement space is 10 times smaller than that of phosphate cement. If one is luting on a tooth substance or on a composite core the dentine may be different along its length.

## THE MECHANISM OF LUTING (UNI MUNSTER)

Phosphate cement (since 1892) has a certain grain size and as such there will be gaps left on the rough surface between the tooth and the crown.

Luting cements have to fill the gap between the restoration and the tooth substance. Zinc Phosphate cement has a PH of 1.8 before setting. It was developed in the 17th century. Hoffmann investigated how it was mixed. The pulp may hurt but up to two days, there is no material luting as this is a purely mechanical retention. So please use an ISO Red ring to cut, do NOT use yellow or white as otherwise there is not enough roughening of the tooth surface.

Capsules are always better as if you use too much liquid the solubility of the cement will be high. One must always advise the lab what luting cement you are using so that they will leave the correct luting gap. There must be a gap of at least 0.5-40 microns. Otherwise the grain size will be larger than the gap and your crown will be high.

## CARBOXYLATE CEMENT

Polyacrylic acid and Zinc Oxide. It is bio compatible and does not hurt. It is not so strong as there is not much

pain with the acid. DURELON by 3M is excellent and the best long term temporary cement on the market. But the crowns can fall off as the water solubility of Durelon is very high.

## GLASS IONOMER CEMENT

Polyacrylic Acid and silicate glass. Be careful with the mixing ratio as you will change the physical properties of the material. The more liquid the more unstable and there is increased solubility. It is better to use capsules. 122-162 MPA.

The acid has a PH of 0.9-1.6 so it may hurt the patient initially but since polyacrylic acid has large molecule size the grains cannot penetrate dentinal tubules so the pain will not last long.

It is important to note that fluoride in luting cement is a bad idea as fluoride will change some chemical reactions.

## DENTAL PREPARATIONS

These should be 6-8 degrees taper. Do NOT use glass ionomer as a temporary luting cement because it will stick to the tooth hard substance and there will be some left during luting. It is best to use zinc oxide based temporary luting cements.



The latest evolution Luting cements are the dual cured. Self cured are old fashioned and exercise care with light cured. Bifix is popular.

## SARC

Self Adhesive LC has an additional adhesive bonding. There is dissolving of the smear layer and demineralisation of dentine. There is infiltration of the dentinal tubules.

Meron is an old GI but is still excellent. Aqua Meron is a very stable luting cement.

MeronPlus is a resin modified GI cement.

Bifix SE is a self adhesive resin cement. BiFix SE is not indicated for luting veneers as there is not much of a preparation.

There are three mechanisms that determine adhesive force

### 1. Inter molecular bonds

Require conditioning. Van Der Waals forces become operative only at small distances 0.1-1mm. Adhesive must show low viscosity. If it fails all the luting will fail.

### 2. Chemical bonds

Change in upper molecular layers eg. Silication followed by silanisation. Eg Rocatec. a chemical connection to the oxygen groups of the silicate layer and the methacrylate group of

the adhesive luting cements. The lab is asked to sand blast it. Apply silane and then use luting composite.

### 3. Mechanical retention

The surfaces are roughened by sandblasting or etching. The glass containing ceramics are acid etched. The glass free zirconium dioxide ceramics are sandblasted.

Zirconium dioxide must not be etched with HF. The primer contains phosphate and the luting cement will not penetrate. The chemical reaction between the primer and the phosphate will create a passive layer. You can just clean with alcohol or in an ultrasonic bath.

Zirconium dioxide - grain size of 50 microns aluminium oxide with jet pressure of 0.5-2.5 bar not to be exceeded at a distance of 10-20 mm with an impact angle of 50-75 degrees. Too high pressure will damage the luting surface.

Please note that HF can penetrate through skin and bone so exercise care with fingers.

### RE.BILDA POST GT

This is a post endodontic build up with a new extension bundle of posts on one piece. The posts stabilise the crown build up and not the tooth. One places dual cure adhesive down the canal. There is a thin endo applicator and this is ideal down the root canal

A ferrule is mandatory for a long lasting core build up.

Do not use NaOCL greater than 2.5% as it does not help as you will lose coronal substance.

Anterior teeth have shearing forces (bad for fillings) and posterior teeth have vertical forces.

With the post system leave 3.5-4mm gp from the apical tip, due to the lateral canals. The new system has several small glass fibre posts.

The Reblida post GT has a greater taper. Please note that old NITI instruments must not be discarded as they are good for removing old gp. Do not use water when cutting the glass fibres.

### GRAND TEC

Glass fibre splint. Use rubber dam but care with the powder as it affects bonding. Use Grandioso flow with it as it is a 78% nano filled flowable.

Grand tec are glass fibre strands that have been soaked with a light cured composite resi, cured and then cut. They have strong double bonds.

Ribbon is made of polyethylene fibres and so there is no chemical bond.

### LIGHT CURED UNITS

When you purchase a unit always ask for a BEAM PROFILE. How is the energy provided when you look at the window of your light tip?

**Always read the manual!**



# FIBRE SPLINTS

By Dr David Muscat

A Fibre splint is a bondable reinforcement ribbon that is pre-impregnated in a light cured resin .

This results in a chemical bond to the bonding and the composite material used.

Fibre splints are saturated with bonding agent, positioned on the etched/bonded palatal/lingual surfaces and then fixed in the interdental area and light cured.

The use of glass fibre versus metallic options is best as it allows for an effective bond to tooth structure and is also highly esthetic.

Fibre splints are used for orthodontic retainers, periodontal/trauma splinting and for implant space maintainers.

With periodontal splinting this is commonly performed on the front teeth. The disadvantages are difficulty in performing oral hygiene and that the splint attracts more plaque accumulation.

There are several companies that produce such splints such as Ribbond, Bioloren In Fibre Fiber, Angelus Interlig ,Reiforce Fibre Splint, FibreGlass Ribbons(Polydentia), Everstick Perio from GC, In Fibrakitglass Reinforcer (Prestige Dental ) Dir Experience Glass fibre Splint (Dei Italia )and Grand Tec by Voco.

Grand Tec are resin impregnated multiple densely packed parallel

running glass fibres impregnated with a special light cured resin.

The glass fibre strands have three times the strength of polyethene materials. It is an additional product for reinforcing composite/flow composite in trauma, periodontology, orthodontics, conservative dentistry and prosthodontics .

Grand Tec is presented as strips of 55mm and 2mm diameter. The strip can be shaped before polymerisation. There is no need to wet the fibre with bond before application. It is best to use Grandioso heavy flow flowable with this material.

When light cured Grand Tec becomes very hard. It can be used as a scaffold on which to build up a tooth to close a gap say after an extraction.

It can be used as a temporary treatment of space maintenance whilst waiting for osseo-integration of an implant. The glass fibre chemically coalesces with the composite material used.

The fracture resistance of the composite is greatly increased. Grand Tec is flexible and can be easily shaped to the desired form.. It has a neutral colour. It may be used with all types of composite and flowable materials. It has outstanding handling. It can also be used to reinforce large span temporary bridges. One can use the same composite instruments and rotary drills with the material.. In the package it is protected from

light with a protective orange film and blister packet. It is certainly an ace up a dentist's sleeve to have this handy in the clinic for those emergency situations when you need an instant remedy.

Lastly by replacing a missing lower incisor on an elderly patient using this system instead of making a denture is great psychologically for an elderly patient as they walk out with a tooth.

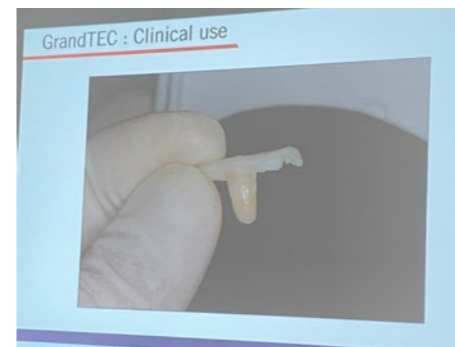
One can also extract a lower incisor, cut off the root, and splint back the crown part in position using the Grand Tec fibre lingually to support it and I have successfully made hundreds of these. 🦷



The use of Grand Tec for a temporary bridge build-up

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 SINCE 1906

# THE PROTAPER ULTIMATE EVENT AT THE PALACE HOTEL SLIEMA BY BART ENTERPRISES

By Professor Goran Tomic  
 Specialist in endodontic and Operative dentistry. Certified Dentsply/Maillefer trainer

Summarised by Dr David Muscat

Prof Tomic took us through the benefits of the DS Protaper Ultimate Rotary File system.

It is essential to separate the procedures of shaping and cleaning. It is imperative to open up the canals sufficiently to be able to clean properly and allow the sodium hypochlorite to work. It is also important to activate the solution and move it around so an endodontic activator would be helpful.

This is important as it removes the debris. Patency is critical. The greater the fluid volume the better.

The Dentsply irrigation needle is designed to provide safe yet efficient distribution of the irrigation solution close to the apex. The irrigation needle has a 60 degree angulation.

It has a 4 per cent taper to match the conical shape of the canal. It has a 30 gauge closed end tip and a 27 mm working length.

The Smart Lite Pro Endo Activator promotes deep cleaning and disinfection to facilitate three-dimensional obturation and long term success.

Continues on page 32





# THE PROTAPER ULTIMATE EVENT

## AT THE PALACE HOTEL SLIEMA BY BART ENTERPRISES

Continues from page 31

I personally use the original Endo Activator kit. It is still good. Fluid activation, in well shaped canals is important in debridement and disinfection of the root canal system. The Endo Activator energizes intracanal irrigants during treatment. The tips are single patient use.

The machine creates fluid hydrodynamics and disrupts the smear layer and biofilm. Activating sodium hypochlorite increases cleaning efficiency as opposed to just using sodium hypochlorite soak.

The Protaper Ultimate system has a sequence that covers the full range of anatomical anomalies.

After using the Sx orifice opener which is standard one uses the Slider. The slider is designed to replace the Proglider. After that one uses the shaper.

Following on from this are the F1,F2and F3. . For larger canals there are the FX and the FXL( upper anterior teeth ). The motor is set to 400 rpm (4-5.2Ncm).The Ultimate system is based on geometry, metallurgy and dynamics.

In cross section the file is a parallelogram so there is contact in the canal at only two points at a time so there is less stress and there is place for dentine chips which can then be flushed out.



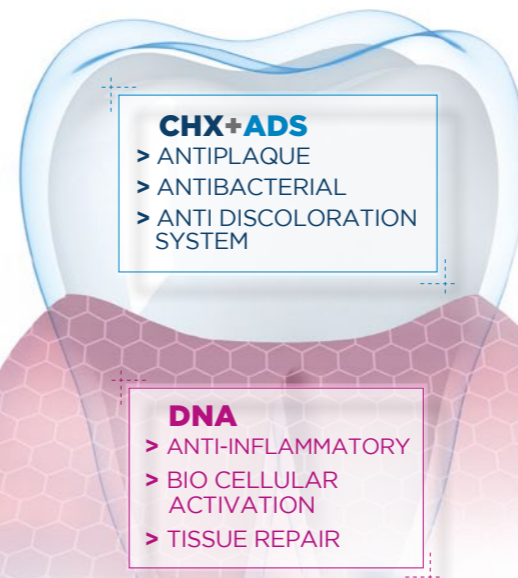
The X Smart Plus Endo Motor can be used with the reciprocating, single file technique as well as the traditional continuous rotation File systems.

There are set programmes for Wave One Gold, Pro Taper Next, Pro Taper Gold, Pro Glider, Path File , Reciproc and Gates. It has an integrated apex locator and a touch screen interface. It has a mini contra angle head with an integrated 10 lumen LED.

There are also The X Smart Pro+Endo Motor as well as the new X Smart Pro +Protaper Ultimate Kit. 📱



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# THE CLEAR CORRECT COURSE FOR BEGINNERS

AT SALINI / 14 MARCH 2024

IN CONJUNCTION WITH BART ENTERPRISES LTD

By Dr Marwa Arzoky

Summarised by Dr David Muscat

## OVERVIEW OF CLEARCORRECT TREATMENT

ClearCorrect treatment can be described as a discreet and effective method for achieving Aesthetic Alignment of teeth, primarily addressing adult patients. While emphasizing aesthetics, ClearCorrect treatment also considers functional improvements, contributing to overall oral health and well-being.

It's important to note that ClearCorrect has its limitations, and not all malocclusions can be corrected with this method. Complex cases, like class III malocclusions requiring significant Distalization movement. When one is unsure one must always refer to a specialist orthodontist.

## PATIENT CONSULTATION

During the consultation, The first most important question at the consultation

appointment is to ask the patient what is it that they are unhappy about regarding their teeth or their smile.

This must be written in the notes exactly as the patient says it-word for word, serving as vital guidance for dentist and the ClearCorrect technician when planning the case.

## ORTHODONTIC ASSESSMENT

It's very important to carry out a full orthodontic assessment at the chairside for our patients as it will make your life much easier later on when planning the case. Orthodontic assessment form was provided as a guide to use.

The orthodontic assessment form involves TMJ examination, smile analysis, intraoral examination, patient preconditions, arch form, crowding/spacing, occlusion in three planes:

1. Sagittal- overjet
2. Vertical-overbite /open bite
3. Transverse –crossbite/scissors bite and radiographic findings. Once the orthodontic assessment form is completed. we can then create a problem list and treatment plan/goals for the treatment.

## CLINICAL PHOTOGRAPHY

Clear, well-lit 8 clinical photographs from different angles are taken part of the assessment to help treatment plan and document the pre- treatments photos.

- Full face (smiling)
- Full face (not smiling )
- Profile of face ( not smiling)
- Upper occlusal view
- Lower occlusal view
- Right lateral view
- Front view
- Left lateral view

(With the smiling view you can also take one from the left and the right.)

If you download the ClearCorrect sync photo uploader app. It can speed up this process, particularly when using mobile devices.

1. Download the app and sign in using your ClearCorrect doctor portal log in.
2. Create a new case
3. Edit an existing case
4. Set a primary photo
5. Capture patients photos
6. Edit patients photos

All the pictures taken by the ClearCorrect Sync app will be uploaded to the ClearCorrect doctor portal.

## INTRAORAL SCANS AND IMPRESSIONS

Following clinical photography, obtaining intraoral scans or impressions is important.

The intraoral scanner submission workflow involves

1. Creating the STL file
2. Creating the case in the Doctor portal
3. Submitting the scan

Once the scans and patient pictures are uploaded, it's optional to include orthodontic radiographs on the ClearCorrect doctor portal. While not mandatory, they play a crucial role in verifying the patient's oral health status before initiating treatment.

## TREATMENT PLANNING:

The treatment planning process involves several crucial steps, including registering the patient's complaint and identifying three reference points:



Upper anterior reference point for aligning the upper arch- We can either use UR1 or UL1 position as a reference point to align upper arch. We also need to consider the soft tissue profile, Upper lip support, Smile Line, Lower lip position and the lip competence.

Are we already happy with the position of UR1 or UL1 in the mouth? Or if we are not happy with the position then we can describe the movement of where to position the tooth either (UR1 or UL1) in the AP position.. e.g translate buccally/lingually, vertical position( intrude/extrude), crown tooth angulation, inclination eg tip the incisal edge buccally By 5-7 degrees and lastly do we need to rotate tooth.

Once happy with the new position then we can use the tooth position as a reference point to align upper arch. Upper arch expansion. considering Space requirements, Aesthetic result (dark buccal corridors) and the biotype/ bone level of the patient before expanding. we can use a tooth that we are already happy with the position of as a reference point to expand upper arch. Choose a teeth whose position you are happy with eg upper 6s. eg expand the upper arch to match upper 6s.

Overjet and overbite assessment, considering various factors like space requirements, biotype, and predictability of overbite reduction. Eg. Reduce overbite to 50%. Finish the case to 2-4 mm overjet. Intrude lower anterior teeth only.

## CLEAR PILOT WORKFLOW

Upon submission, there is 5 steps to follow to help check the clearpilot treatment plan

## BITE ASSESSMENT

Read technician comments and check scans to ensure comprehensive coverage of all the teeth.

Compare the treatment plan to what was prescribed, to check that it's following the dentist prescription. If the treatment plan does not follow the instructions prescribed. You can make modifications as needed.

Also if you're happy with the IPR staging, engagers, anchorage and etc. Obtaining patient consent, setting expectations, and addressing potential challenges or risks.

## ADDITIONAL TIPS:

Ensure thorough scanning of all teeth, including the 8s. Pay close attention to red triangles indicating difficult movements. Verify attachments and IPR staging for optimal results.

In conclusion, achieving outstanding results with Clear Correct, requires a thorough assessment, and effective communication between the dentist and patients. By adhering to these principles, dental practitioners can consistently deliver optimal outcomes and ensure patient satisfaction. 📌



# THE CLEAR CORRECT PRESENTATION ON ANTERIOR OPEN BITE

## CLEARCORRECT COURSE STUDY CLUB – OPEN BITE

By Dr Marwa Arzoky

During the ClearCorrect course study club, the focus was on discussing open bite cases and understanding the various factors contributing to this condition.

Participants explored the definition of an open bite, highlighting its aesthetic concerns and potential masticatory issues, overloading of posterior teeth and etc...

There is different types of Etiology that causes an open bite such as oral habits such as thumb sucking, lip and tongue habits.

Excessive growth of lymphatic tissues which causes the tongue to protrude forward. Genetic/environmental causes such as trauma, abnormal growth pattern of the maxilla and mandible etc...

Discussed the clinical characteristics that these patients present with such as anterior open bite, lip incompetence, excess lower anterior face height, narrow maxilla and posterior crossbite etc...

Discussed the importance of trying to know what the cause of open bite before starting the treatment to avoid relapse. The importance of conducting a thorough orthodontic assessment using the orthodontic assessment form.

Things to consider when planning open bite cases can be the anterior teeth position, smile Aesthetics such as smile line and



smile arc of the patient as this can effect the treatment plan.

Discussed the treatment options with ClearCorrect - can be either anterior extrusion or combination of anterior extrusion and posterior intrusion.

### BIOMECHANICS OF OPEN BITE

for Extrusion to be successful - we aim for mass extrusion of the teeth, check anterior attachments and Assess upper incisor position.

For intrusion to be successful- use chewies and posterior bite ramps

### DISCUSSED RETENTION

High risk of relapse- most accurate way to access is the amount of anterior open bite at the start of the treatment. Long term retention is needed and any habits need to stop before starting the treatment. Looked at cases from start to finish. Starting with orthodontic assessment, creating a problem list and treatment plan/ goals of what we will accept as we cannot correct, things that we can improve and things we can correct.

The study club finished with a quick quiz. 📝

# THE RETENTION PROTOCOL FOR CLEAR CORRECT ALIGNERS

By Dr Marwa Arzoky, Clear Correct Ambassador

### RETENTION

Histological studies have shown that the supracrestal periodontal fibers remain stretched and displaced for more than 7 months after the cessation of orthodontic tooth movement, suggesting that the retention period should generally be at least 7 months.

However the gold standard today is that retention is for life!

It is up to you as a clinician to decide what retention protocol works best for you and your patients.

The options for retainers are:

1. Removable Retainers (ClearCorrect retainers)
  - \* Can be provided for every case
2. Fixed wire Retainer
  - \* Certain cases are at higher risk of relapse such as:
    1. anterior spacing cases
    2. cases with severe rotations
    3. periodontal cases.

A fixed and removable retention protocol can be beneficial in these cases.

As a minimum patients should wear removable retainers at night time for life.

In my practice if the patient has a removable retainer only we advise 6 months full time wear and then night time for life.

If they have a fixed retainer also it is removable retainers full time for 2 weeks and then night time wear for life. 📝



# DENTAL MICROSCOPES EVENT

AT THE PALACE HOTEL SLIEMA / 26 MARCH 2024

BART ENTERPRISES – TECHNOLINE DENTAL DAY

By Dr Christian del Rey – Schnitzler Zeiss International speaker

Summarised by Dr David Muscat

Dr Schnitzler lectured in the benefits of the Zeiss Extaro 300 microscope and Loupes.

The latest microscope is being described as a 'Game changer'.

The Zeiss Extaro 300 allows for better patient communication with diagnosis and treatment planning. It also improves assistant communication as one has a live screen on the treatment field and a live stream.

The system allows communication with outside collaborators and an enhanced demonstration workflow as well as cloud storage.

There are also voice control features and voice command.

There is a long focal range and this allows better visual access, quicker focusing and better ergonomics. It is ideal for different parts of the mouth, different planes of the mouth and also different teeth at the same time.

In endodontics one works in one plane and does not move the microscope much.

There is no glare and there is an absence of reflections.

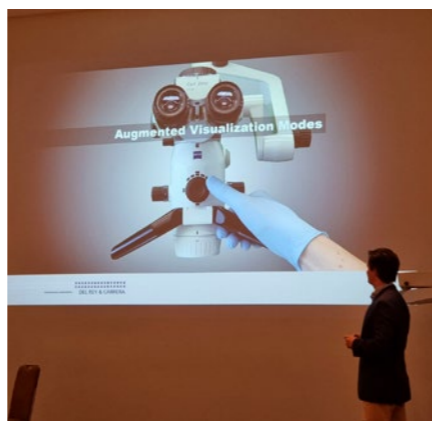
When working with composites one can select the 'no glare mode' to select a shade.

With the fluorescent mode there is augmented visualisation. Violet light is projected, and this is absorbed by the tissues. The dentine and enamel will emit fluorescent light. New composites as well as ceramics are highly fluorescent. With the microscope one can differentiate between real teeth, composites and ceramic crowns etc.

Bacteria also absorb violet light and emit fluorescent light. Our eyes need to get accustomed to it. The human eye can distinguish up to 200 microns as two distinct images.

Anything smaller than that and one needs a microscope anything smaller than 200 microns will be seen as a line.

Zeiss loupes were also available for use at a concurrent Protaper Ultimate hands on session.



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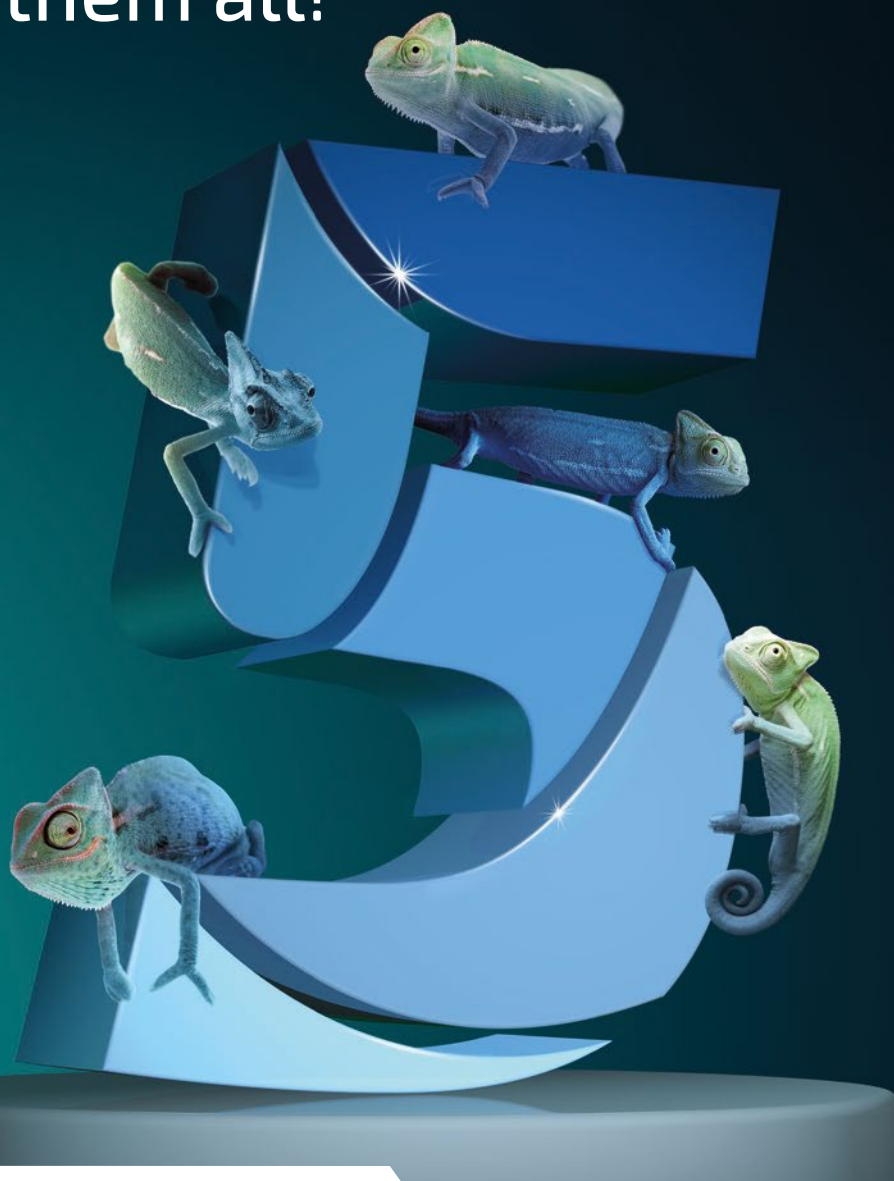
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