E-BOOK

AUGMA BONE CEMENT ACADEMY

Bone Graft Cements
Cyst Treatment

Contents

OVERVIEW

INTRODUCTION & CASE BREAKDOWN

Introduction

Use of biphasic calcium sulfate in treatment of dentigerous cyst and benign tumors of the jaws

Among the patients of the Oral Surgery Department, a significant percentage are people requiring treatment due to the diagnosis of odontogenic cysts in the jaw bones. Most of these cysts, of various etiologies, require surgical treatment. The most common lesions of various origins include the germinal cyst, while the broadly understood root cyst, as a chronic inflammatory pathological condition, may constitute the highest percentage of recognizable lesions of this type in the jaw bones. Statistically, it is over 60% of odontogenic cysts and over 50% of bone cysts [1,2].

Various methods are used in the surgical treatment of odontogenic cysts; from savers through aggressive to extremely rarely radical. In the group of sparing methods, an interesting alternative to the well-known marsupialization is a two-stage treatment, in which cyst decompression is used first. It consists in making a decompression hole through all tissue layers, including the cyst wall, which is obligatorily verified by histopathological examination. The created hole is secured with a rubber drain and then an acrylic obturator is made, which may be a part of a prosthesis or orthodontic appliance. The obturator protects the created opening and allows the bone to slowly rebuild after the pressure inside the cyst cavity is removed. This stage of the procedure is also known as Drozdowski's modification. After an appropriate period of time and the reduction of the lesion volume is achieved, curettage of the remaining cysts is performed in conjunction with peripheral mechanical bone curettage. The entire biopsy is verified histopathologically. A wide panel of available bone substitutes can be used for bone cavity augmentation [1-6].

Introduction

Use of biphasic calcium sulfate in treatment of dentigerous cyst and benign tumors of the jaws

In many cases with dentigerous cysts and benign tumors of the jaws we prefer one-step method using endodontic microsurgery techniques, especially when the teeth in the cyst or tumor area are in good condition. Development of microsurgical techniques with the use of dedicated microtools and optical instruments, such as operating microscopes whether the magnifiers made it possible carrying out effective treatments in the operating microarea, without the need to remove excessive amounts of bone tissue and periodontal apparatus. Also, ultrasonic devices and new filling materials allowed for proper preparation and backfilling of the canal of the resected tooth [1-7].

In this e-book, we will present a series of clinical cases of one and two-stage treatment of dentigerous cysts and benign tumors of the jaws. Bond Apatite® was used in the regeneration of bone defects in each case.

In 3-month to 5-year follow-up period among 240 patients (Table 1)., good remodeling of the new bone without any inflammatory lesions and good results in 97% of operations has been observed.

Table 1
Sample Size: 240 Patients

Quantity of patients	n = 240
Age (years) Mean age (years)	22 – 78 52.7
Sex F/M	100/140
Range of diameter of the cyst min/max (mm) Mean (mm)	4-65 18.7
Topography maxilla/mandible	126/114
Front segment of the maxilla	90
Lateral segment of the maxilla	36
Front segment of the mandible	34
Lateral segment of the mandible	80
Resection of the root	206
Two steps treatment of the cysts	12
Extraction of the root	52
Quantity of graft using(cc)	310

Cyst Removal Using Bone Graft Cement | Key Points

All-in-One Smart Syringe - Augma presents in a preloaded syringe, ready to be applied to the host site. This allows the grafting workflow of the case to be time saving and efficient.

A Cement – Augma Bone Graft cement is self adherent, thus once properly compacted it will stay in place.

No Membrane – Augma Bone Graft cement is self contained therefore membrane containment is not required.

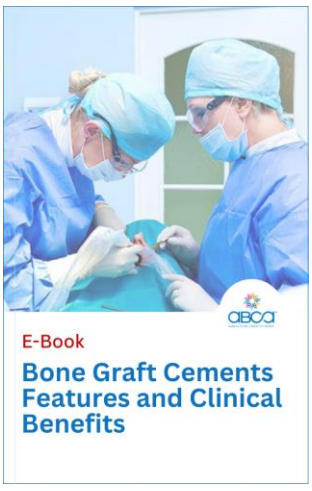
Bioactivity – Biphasic Calcium Sulfate, Augma's key component, has bioactive properties, thus stimulating the host to direct resources to the graft site for bone regeneration.

True Bone Regeneration – Biphasic Calcium Sulfate serves as a scaffold until true bone is formed.

Explore each of these benefits by viewing Augma's Bone Graft Cement – Features & Clinical Benefits E-Book

Including clinical cases, research & histological evidence and instructional videos

Access the E-Book



Graft Application | Step-by-Step

All surgeries in this e-book were performed with Augma Bond Apatite®. Watch the videos below for step-by-step instructions for site preparation, graft application and closure using Bond Apatite®.

Instructional Video
Lateral Augmentation Protocol

Watch

Animated Protocol
Lateral Augmentation
Step-by-Step Instructions

Watch

Augma How-To
Step-by-Step Instructions

Watch

Case Level Breakdown

- **Level I | Small Cysts in the Anterior Jaw** – Small cysts up to 1cm in diameter with a range that does not exceed one third (1/3) of the root length, especially on the palatal or lingual side. The palatal or lingual cortical laminas are not damaged, and there are no active fistulas on the mucosa.

- **Level II | Lateral Cysts & Complex Cysts** – Large cysts with a diameter of more than 1cm in which there is damage to one or both cortical laminas, with a range of more than one third (1/3) of the root length in palatal and lingual side and the location of the cyst is either near the sinus or the alveola nerve. These include huge cysts which need to be treated in two steps: decompression with drainage and obturator, followed by the removal of the cyst after 9 months with a decrease in diameter and range that is visible on X-rays.

- **Level 3 | Large Cysts & Benign Tumors** – Cysts with more than 1cm in diameter, small tumors of all sizes, with difficulty in diagnosis. This level includes cysts and tumors in which it is necessary to take a sample for histopathology to confirm the structure of the tumor before surgical removal. Along with removal of the tumor, radical peripheral bone curettage is done with range from 1-3mm around the defect.

Clinical Cases Per Level

View specific cases by clicking on the case title

Level I | Small Cysts in the Anterior Jaw

- Radicular Cyst of the Right Maxilla
- Small Cysts in #12(7) & #22(10)
- Removal of Two Small Cysts with Apicoectomy and 4 Year Follow Up

Level II | Lateral Cysts & Complex Cysts

- Large Cyst of the Mandible
- Endodontic Microsurgery of Tooth #26 (14)
- Large Cyst Enucleation, Apicoectomy with MTA Retrograde Filling and Bond Apatite®
- Cyst of the Anterior Left Maxilla
- Cyst Enucleation & Apicoectomy
- Large Cyst of the Front Right Maxilla
- Cyst of the Right Maxilla and Prosthetic Restoration
- Endodontic Surgery: Apicoectomy #35 (20) with Cyst Removal and Bond Apatite®
- Cyst of the Lateral Maxilla

Level III | Large Cysts & Benign Tumors

- Central Ossifying Fibroma of the Anterior Mandible
- Central Odontogenic Fibroma & Central Osteoma of The Mandible
- Invaginated Tooth #12 (7)
- Osteoid Osteoma in the Front of the Mandible
- Osteoid Osteoma of the Mandible, Lateral Right Side

Disclaimer

This e-book is for illustration purposes only and should not be viewed as a surgical instructional manual. Proper supervised training is recommended prior to attempting any procedures discussed in this manuscript.

6 CE CREDITS **CERTIFICATE OF ATTENDANCE** **GLOBAL REACH**

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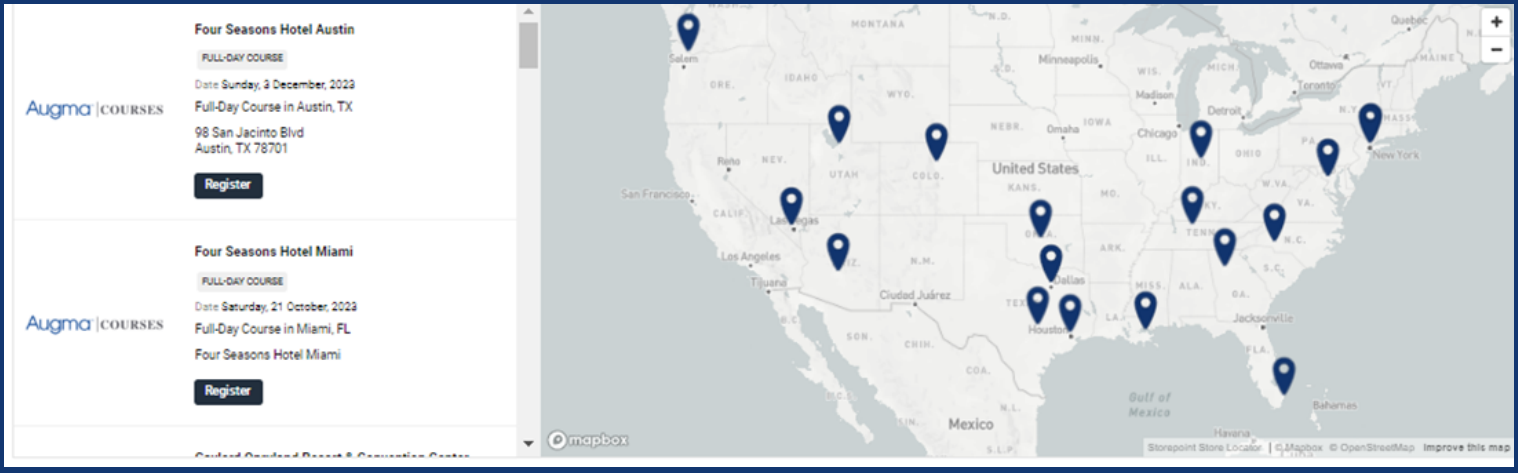

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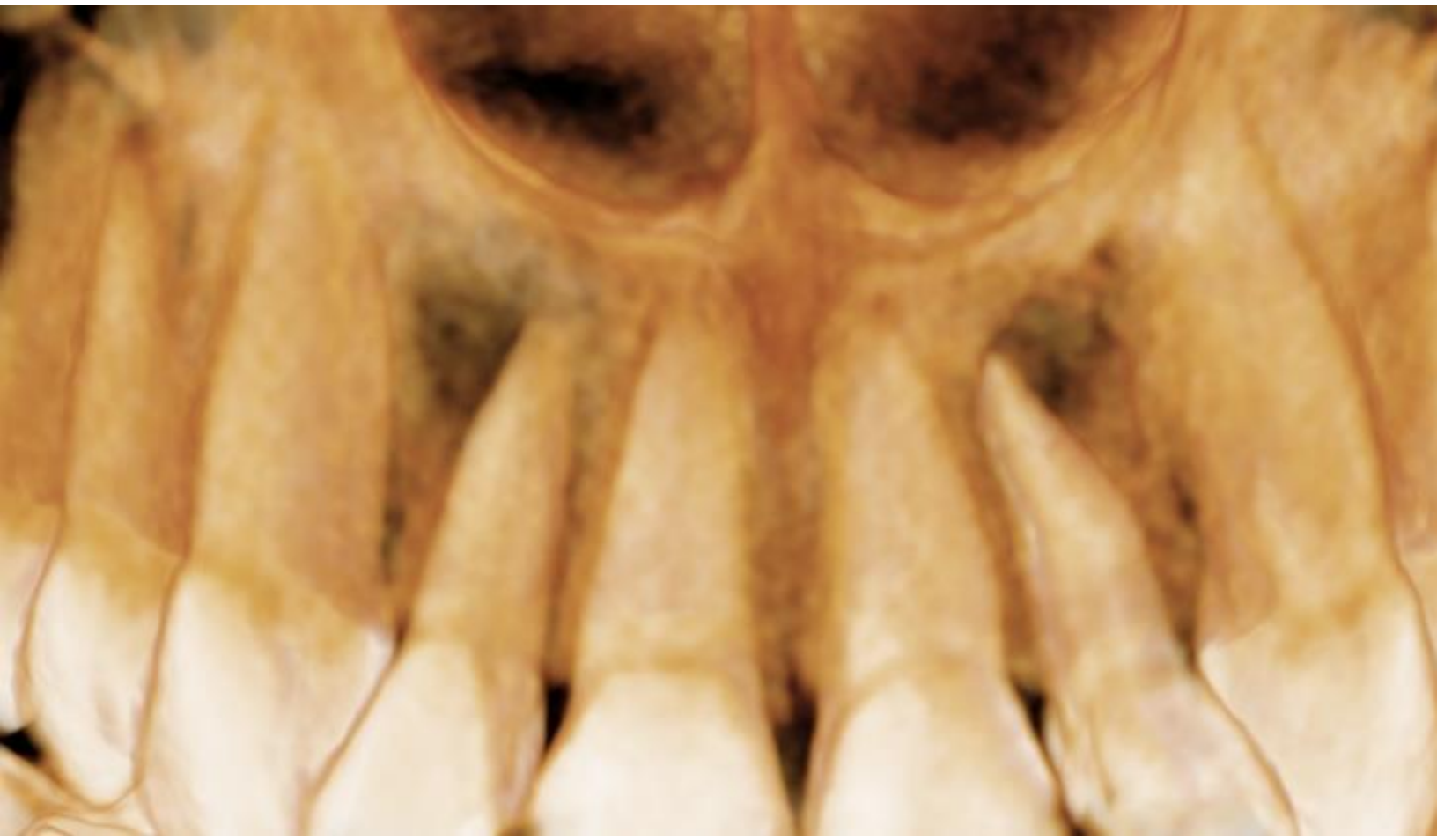


SMALL CYSTS IN THE ANTERIOR JAW

Level I | Evaluation and Planning
One-Stage Treatment of Small Cysts in the Anterior Jaw

- Evaluation:
  - Evaluation of X-ray images.
  - Determine the dimensions of the lesion.
  - CBCT images are used to evaluate the anatomical position of the tooth in relation to other structures, such as the maxillary sinus, inferior alveolar nerve and adjacent teeth.
- Planning the procedure:
  - It is recommended to use tools which are micro-instruments dedicated to endodontic surgery and Kim-Pecor retractors.
  - The position of the patient on the treatment chair is semi-recumbent. The patient keeps his mouth closed during the entire procedure.
  - One assistant is recommended.

Level I | Step-By-Step
One-Stage Treatment of Small Cysts in the Anterior Jaw

- The incision is made at the discretion of the clinician. However, it is important that the incision lines are located beyond the range of future bone defects to expose the entire defect.
- After dissecting the mucoperiosteal flap, make a trepanation hole in the external cortical plate at the level of the tooth root apex. In cases where the bone plate was destroyed by a pathological lesion, prepare the already existing hole.
- The hole is made with a surgical micromotor, using carbide drills or a piezo device. The hole should be at a proper size to see the operation area.
- Next, we dissect the cyst wall from the hard tissues using bone microcurretes. Expose the tip of the tooth root and resect no more than 3mm perpendicularly to the long axis of the root.
- The next stage is the preparation of the root canal and possible additional canals using a piezo device and dedicated diamond tips to a depth of 3mm. The prepared canal is filled with a dedicated cement, for example Pro Root MTA (Mineral Trioxide Aggregate).
- After obtaining the tightness of the filled canal, we proceed to augmentation of the bone defect with Bond Apatite® according to the bone cement protocols.

Level I | Step-By-Step
One-Stage Treatment of Small Cysts in the Anterior Jaw

- After compacting the material in the bone defect according to the bone cement protocols, we suture the wound. It is recommended to use monofilament sutures, non-resorbable, sizes 5-0 or 6-0).
- It is very important not to cut the periosteum for the purpose extending the flap.
- If necessary, use pharmacotherapy (antibiotics, analgesics) and anti-edematous dexamethasone in a decreasing dose of 8 to 2 mg for the next 4 days.
- One-week post-op, the stitches can be removed, and X-rays are taken to determine the shape of biomaterial in the bone defect.
- Follow up visits are done in 3 and 6-month post-op.

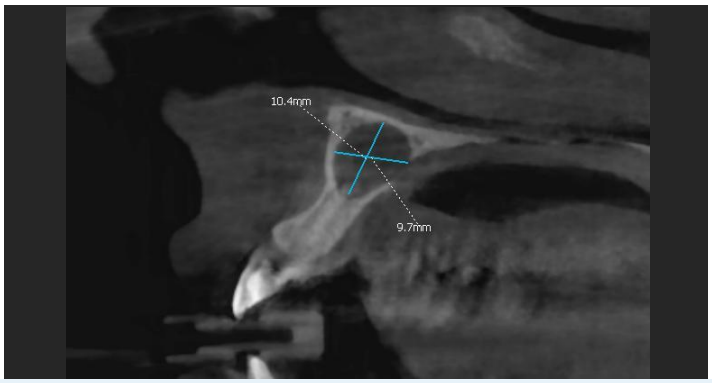
LEVEL I, CASE #1 | CASE DESCRIPTION

Radicular Cyst of the Right Maxilla

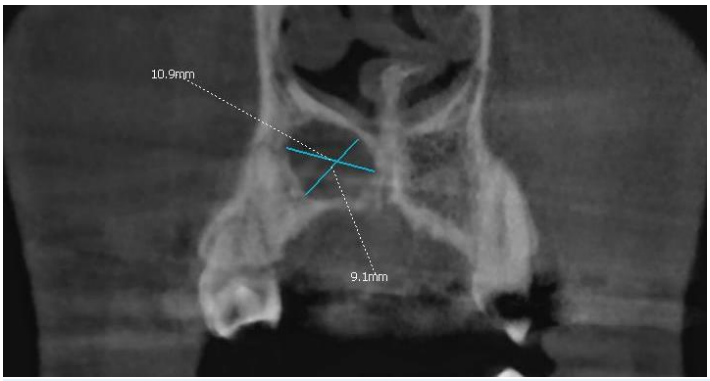
- The patient is a healthy 32-year-old woman.
- The cyst has not resolved 3 months after endodontic treatment. She has daily pain and discomfort.
- A root resection of teeth #12 (7) and #11(8) was performed with cyst enucleation and histopathology examination.
- We filled the bone defect with Bond Apatite® (1 cc).
- 4-year follow-up showed good remodeling of the bone and good healing was observed.

CLINICAL EVIDENCE

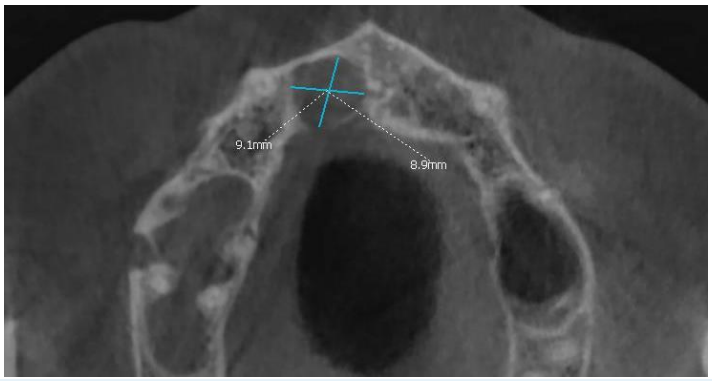
Pre-op X-ray



CBCT - diameter of the cyst



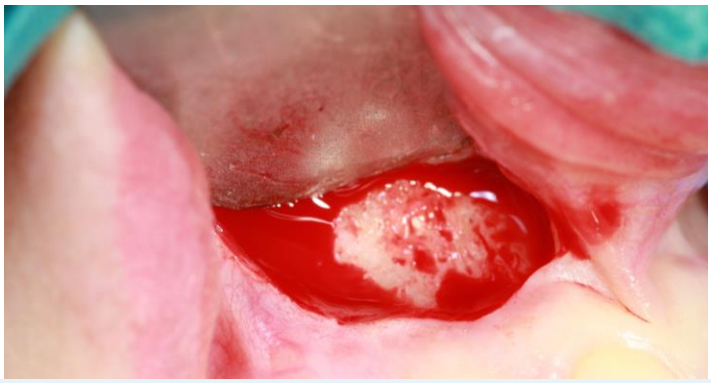
CBCT - diameter of the cyst



CBCT - diameter of the cyst

CLINICAL EVIDENCE

X-ray after canal filling of roots #11 (8), & #12 (7)



Flap opening

Retrograde filling of root canal #11 (8)

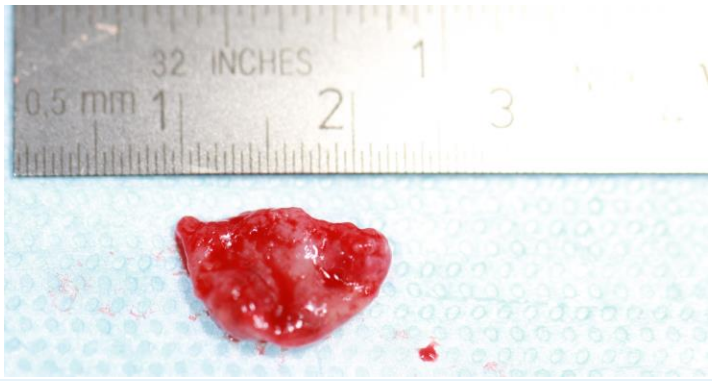
Sutures

CLINICAL EVIDENCE

Control X-ray one day post-op

After cyst enucleation, apex resection of #11 (8) & #12 (7), and retrograde filling of the root canal of #12 (7).

Bond Apatite® in situ



Cyst after enucleation

CLINICAL EVIDENCE

Control X-ray after 3 months

Control X-ray after 6 months

Mucosa 4-year follow up

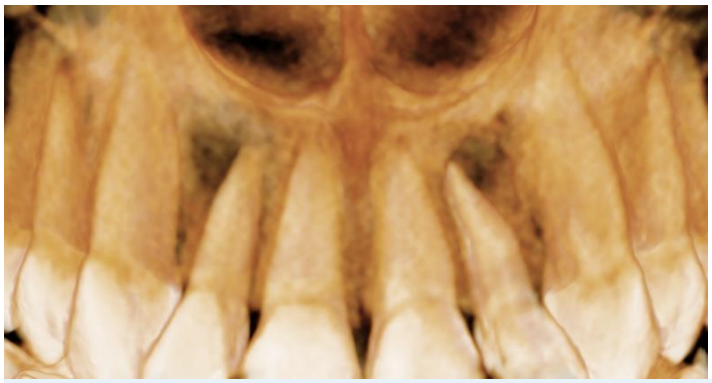
X-ray 4-year follow up

LEVEL I, CASE #2 | CASE DESCRIPTION

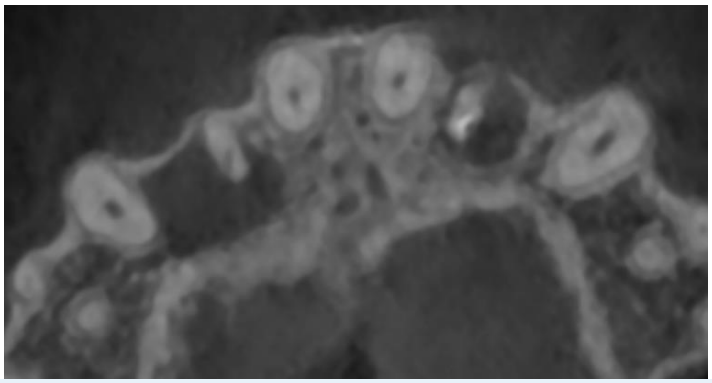
Small Cysts in #12 (7) & #22 (10)

- The patient is a healthy, 20-year-old female.
- Two cysts are discovered after she experienced strong pain in area of tooth #12 (7). The cyst is not resolved after 4 months of endodontic treatment.
- She has occasional pain and discomfort during this period.
- Root resection was performed on teeth #12 (7) and #22 (10).
- At this same time, cysts enucleation with histopathology examination confirmed radicular cysts.
- The bone defect was filled with Bond Apatite® (1cc). More Bond Apatite® was used in #12 (7) and #22 (10).
- Two-year post-op follow up showed good remodeling of the bone, and healing was observed.

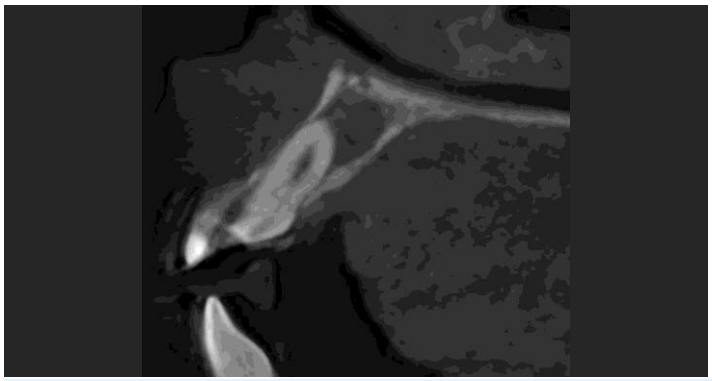
CLINICAL EVIDENCE



3D CBCT showing small cysts on teeth #12 (7) and #22 (10)



Horizontal CBCT showing visible changes

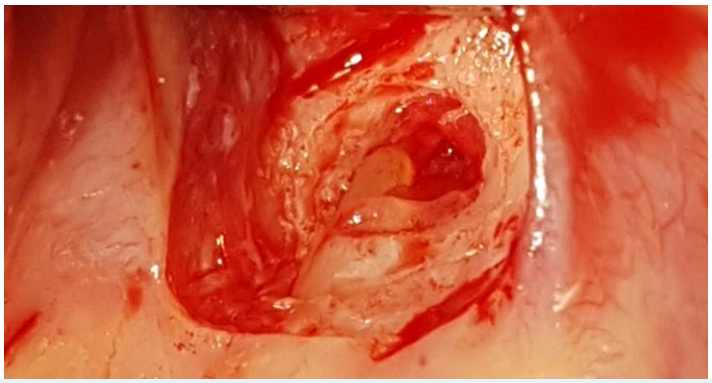


Cyst #12 (7)

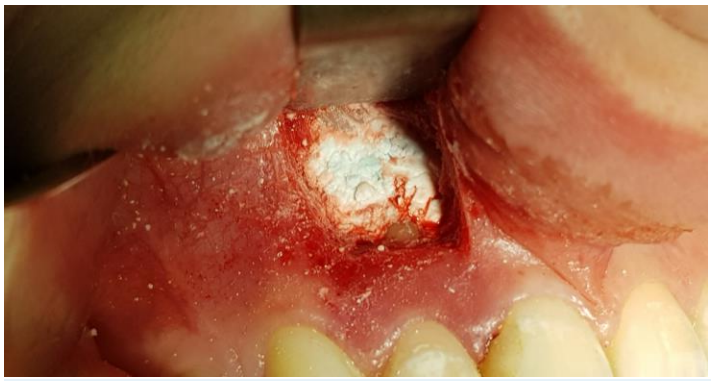
Cyst #12 (7) after 4 months post endodontic treatment

CLINICAL EVIDENCE

Opening, trepanation and cyst removal #12 (7)



Opening cyst #22 (10)



Bond Apatite® inside defect #12 (7)

Bond Apatite® inside #22 (10) defect, 2 minutes after placement

CLINICAL EVIDENCE

Suture area #12 (7)

Suture area #22 (10)

X-ray 7-days post-op - #12 (7)

X-ray after 7-days - #22 (10)

CLINICAL EVIDENCE

X-ray 2-years post-op - #12 (7)

X-ray 2-years post-op - #22 (10)

Mucosa 2-years post-op

LEVEL I, CASE #3 | CASE DESCRIPTION

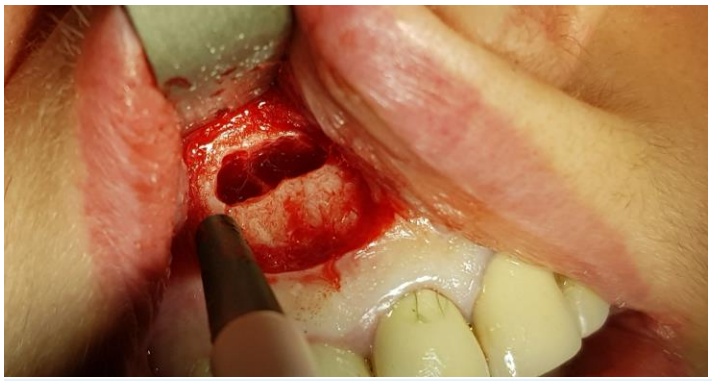
Removal of Two Small Cysts with Apicoectomy and 4 Year Follow Up

- The patient is a healthy, 40-year-old female.
- Two small cysts are discovered after complaining of occasional pain and discomfort in the areas of teeth #12 (7) and #11 (8).
- Root resection was performed on teeth #12 (7) and #11 (8) simultaneously.
- Enucleation of the cysts was done with histopathological examination, which confirmed radicular cysts.
- The bone defect was filled with Bond Apatite® (1 cc).
- 2-year follow-up showed good remodeling of the bone and soft tissue healing.

CLINICAL EVIDENCE

Initial aspect, 2 years after post endodontic treatment.

Opening of the flap, the cysts are visible.



After cyst removal and apicoectomy on teeth #11 (8) & #12 (7).

Bond Apatite® in place

CLINICAL EVIDENCE

Sutures

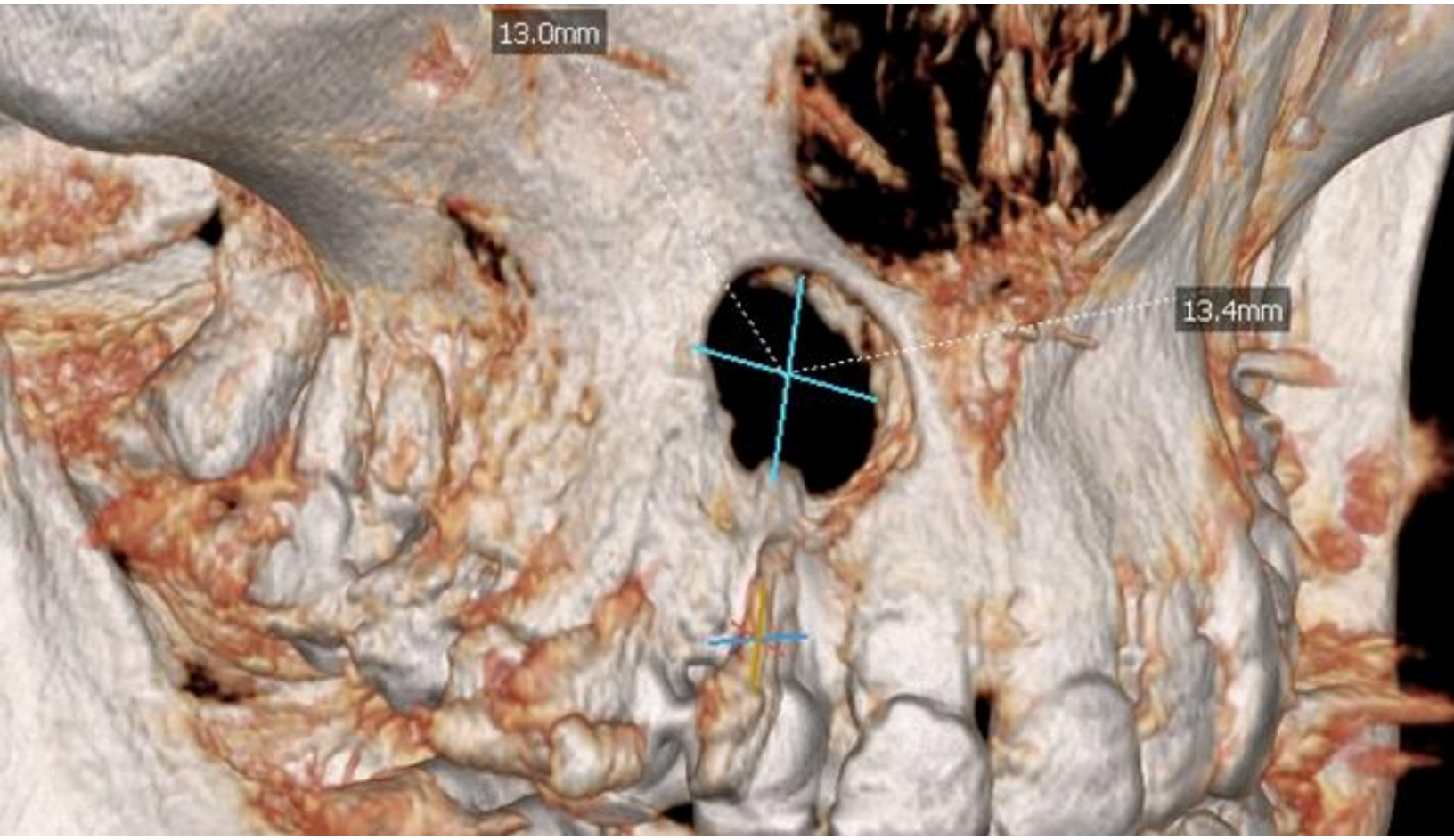
Control X-ray 12-months post-op

Mucosa 12-months post-op

CLINICAL EVIDENCE

X-ray 4-years post-op

Mucosa 4-years post-op



LATERAL & COMPLEX CYSTS

Level II | Evaluation and Planning
One-Stage Treatment of Large Cysts

- Evaluation of X-ray images.
- Determine the dimensions of the lesion.
- CBCT images are used to evaluate the anatomical position of the tooth in relation to other structures, such as the maxillary sinus, inferior alveolar nerve and adjacent teeth.
- It is very important to determine the amount of damage to the bone around the cyst.
- Planning the procedure:
- It is recommended to use micro-instruments dedicated to endodontic surgery and Kim-Pecor retractors.
- The position of the patient on the treatment chair is semi-recumbent. The patient keeps their mouth closed during the entire procedure.
- One assistant is recommended.

Level II | Step-By-Step
One-Stage Treatment of Large Cysts

- The incision is made at the discretion of the clinician. However, it is important that the incision lines are located beyond the range of future bone defects in order to expose the entire defect.
- After dissecting the mucoperiosteal flap, we make a trepanation hole in the external cortical plate at the level of the tooth root apex, or we prepare an already existing hole in the bone plate in the case of its destruction by a pathological lesion.
- The hole is made with a surgical micromotor, using carbide drills or a piezo device. The hole should be at a proper size to see the operation area.
- Next, we dissect the cyst wall from the hard tissues using bone microcurretes, exposing the tip of the tooth root, which we resect no more than 3 mm perpendicularly to the long axis of the tooth root.
- The next stage is the preparation of the root canal and possible additional canals using a piezo device and dedicated diamond tips to a depth of 3 mm. The prepared canal should be filled with a dedicated cement, for example Pro Root MTA (Mineral Trioxide Aggregate).

Level II | Step-By-Step
One-Stage Treatment of Large Cysts

- After obtaining the compactness of the filled canal, we proceed to augmentation of the bone defect with Bond Apatite® and compacting it according to the bone cement protocols.
- After compacting the biphasic calcium sulfate in the bone defect according to the bone cement protocols, we suture the wound. It is recommended to use monofilament sutures, non-resorbable, sizes 5-0 or 6-0.
- It is very important not to cut the periosteum for the purpose of extending the flap.
- If necessary, we use pharmacotherapy (antibiotics, analgesics) and anti-edematous dexamethasone in a decreasing dose of 8 to 2 mg for the next 4 days. Then, after one week, the stitches could be taken off and we do x-rays to control the shape of biomaterial in the bone defect.
- Next control visit will be done in 3- and 6- months.

Level II | Evaluation and Planning
Two-Stage Treatment of Large Cysts

- Step one-decompression of the cyst.
- Evaluation:
- Evaluation of X-ray images.
- Determine the dimensions of the lesion.
- CBCT images are used to evaluate the anatomical position of the tooth in relation to other structures, such as the maxillary sinus, inferior alveolar nerve and adjacent teeth.
- CBCT images are used as primary examination for planning the decompression.

Planning the procedure:

- It is recommended to use standard oral surgery instruments. Kim-Pecor retractors are not necessary but could be used if they help in a specific clinical situation.
- Any position of the patient on the treatment chair can be used. The clinician chooses the best position for doing the decompression based on location and access to the lesion.
- One assistant is recommended.

Level II | Step-By-Step
Two-Stage Treatment of Large Cysts

- The incision is made at the discretion of the clinician. However, it is important that the incision is above the cyst wall and top of the ridge if possible. In the future there will be an obturator with overdenture or part-device such as an orthodontic appliance. It is important to choose a location for the incision where it is easy to take a sample for histopathology and for drainage fixation.
- First, cut through all layers (mucosa, connective tissue, cyst wall), and take samples for histopathology. For the samples take sections of the cyst wall and, if possible, the liquid from inside to cytology, to find any neo-plasmatic cells.
- The drain is inserted into the cyst through the defect and fixed with standard stitches (for example nylon 3-0 or 4-0) for 7 to 10 days. The drain could be a prepared part of sterile tracheal tube or urinary catheter, both of which have X-ray markers to control the position of the drain inside the defect. Follow up visits should be done every day, including decontamination, and rinsing the cyst inside with antiseptics.

Level II | Step-By-Step
Two-Stage Treatment of Large Cysts

- After 7 to 10 days when the tissue epithelized, the stitches are removed but the drainage should be left inside. Impression with standard prosthetic spoon is done. It is recommended to use impression material such as Impregum Penta or anything similar. We put some material from a dedicated syringe into the drain, and the rest into the spoon. After mass concentration, the drain will be taken out with the impression in right position. Then the overdenture can be done in typical process.
- Next, the patient should use the overdenture throughout the next 9 months. Follow up X-rays are recommended once every two or three months. During this period, observe the progress of the treatment. In addition, do not wait more than 9 months, because some studies (August M, Faquin WC, Troulis MJ, Kaban LB. Dedifferentiation of odontogenic keratocyst epithelium after cyst decompression. J Oral Maxillofac Surg 2003; 6: 678-683) recommended 9-month follow-up in first stage of large keratocysts Two-Stage treatment. The authors suggest that after 9 months of maintenance the obturators may initiate remodelling of the histological structure of the cyst towards more dangerous odontogenic tumors.
- By clinical control, if the patient feels pressure while using the prosthesis, the obturator should be shortened.
- 9 months later the second stage of the treatment begins with removal of the rest of cyst after decreasing its diameter.

Level II | Step-By-Step
Two-Stage Treatment of Large Cysts

- Step two - removal of the cyst
- Incisions are made at the discretion of the clinician; however, it is important that the incision lines are located beyond the range of future bone defects and going through the epithelized hole for the obturator.
- After dissecting the mucoperiosteal flap, prepare the trepanation osteotomy in the external cortical plate around the position of the obturator. The osteotomy is made with a surgical micromotor, using carbide drills or a piezo device.
- The bony access must be slightly larger to ensure good visibility of the operation area. Separate the cyst wall from the hard tissues using bone microcurretes, Lucas curretes and also raspatory.
- The rest of the cyst should be sent for histopathology examination and compared with the first sample. Peripheral bone curettage is done around the defect, up to 2 mm deep using hand instruments and mechanical devices such as surgical micromotors, piezo ect.
- The histological and biological structure of the lesion remains unknown after 9 months. This is why it's important perform optimal radicalism to eliminate, for example, satellite microtumors if the cyst has changed to a tumor.

Level II | Step-By-Step
Two-Stage Treatment of Large Cysts

- Finally, proceed to augmentation of the bone defect with Bond Apatite® according to the bone cement protocols. (insert link)
- After well compacting the material in the bone defect, using fingers, raspatory and dry gauze, we suture the wound (recommended monofilament sutures, non-resorbable, sizes 5-0 to 3-0).
- It is very important not to cut the periosteum for the purpose extending the flap.
- If necessary, use pharmacotherapy (antibiotics, analgesics) and anti-edematous dexamethasone in a decreasing dose of 8 to 2 mg for the next 4 days. Stitches can be removed one-week post-op, and X-ray images are taken to confirm the shape of biomaterial in the bone defect.
- Follow up visits are done 3-, 6-, and 12-months post-op, and then once a year for a 5-year period following the surgery.

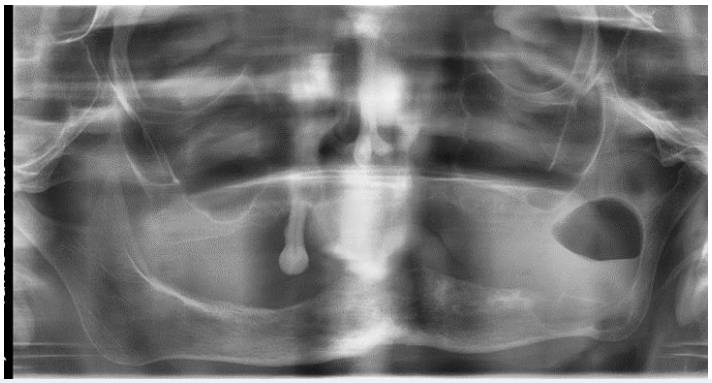
LEVEL II, CASE #1 | CASE DESCRIPTION

Large Cyst of the Mandible

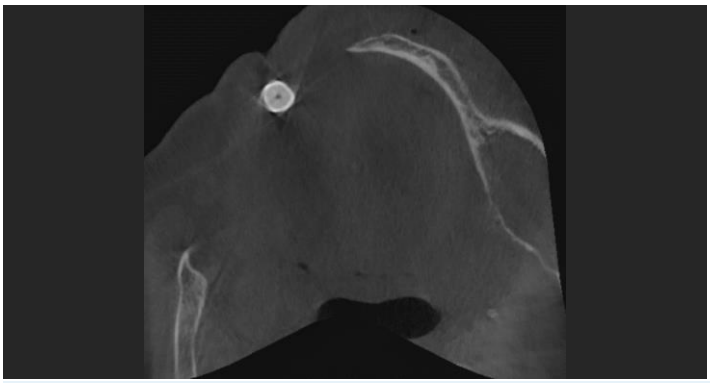
- The patient is an 82-year-old female that presented with swelling and pain on the left side of the cheek and lip, and Vincent syndrome.
- The treatment involved cyst removal and filling of the bone defect with Bond Apatite®.
- Follow up showed very good bone remodelling, and no inflammatory symptoms were observed.

CLINICAL EVIDENCE

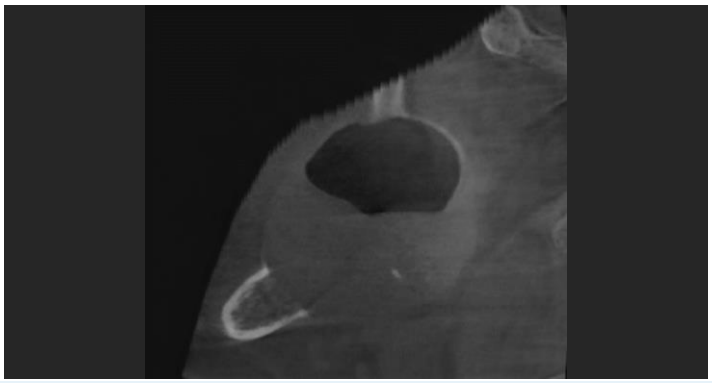
Pre-op radiography



After decompression of the cyst

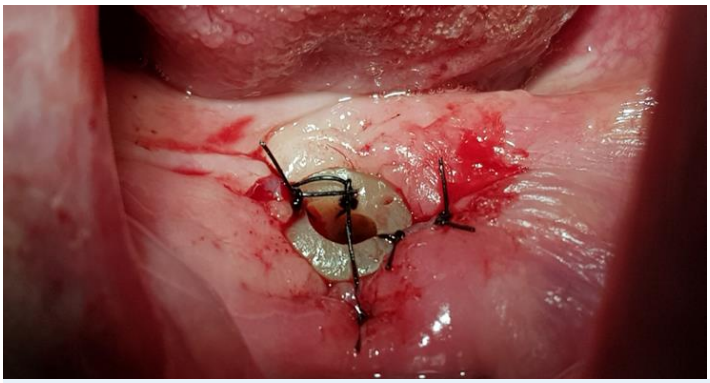


Pre-op CBCT



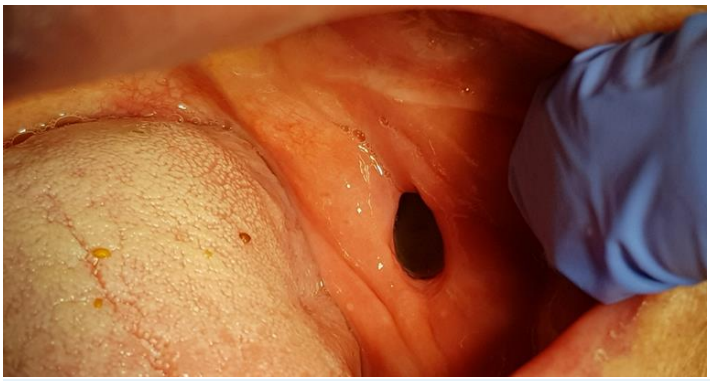
Pre-op CBCT

CLINICAL EVIDENCE



Drainage fixed with sutures

3-month follow up



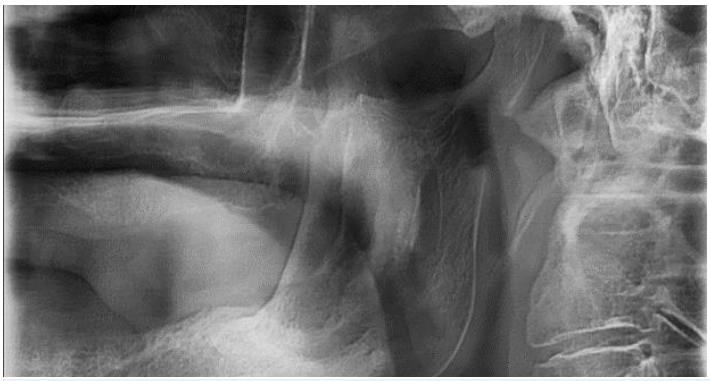
Hole for the obturator

Overdenture with obturator

CLINICAL EVIDENCE

Overdenture

5-month follow up in which the diameter of the cyst is significantly reduced.

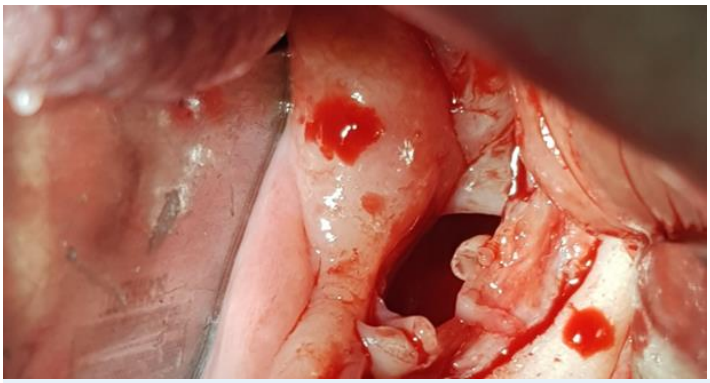


7-month follow up

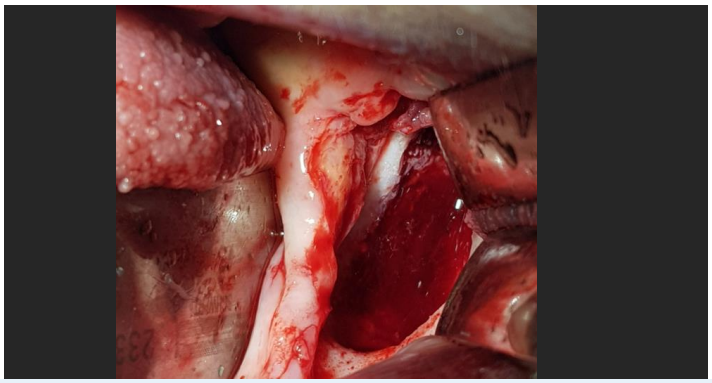
9-month follow up

The range of the cyst is less visible than in the beginning.

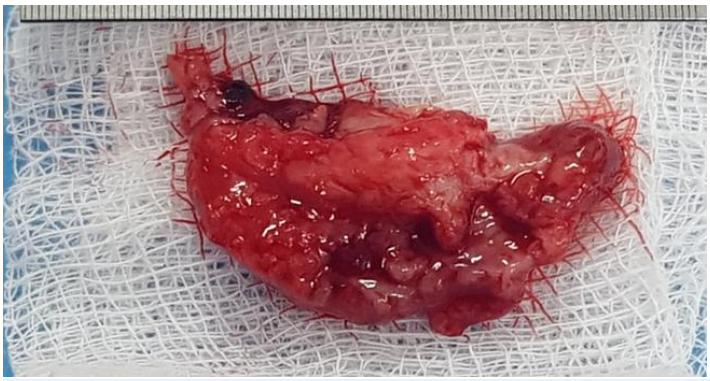
CLINICAL EVIDENCE



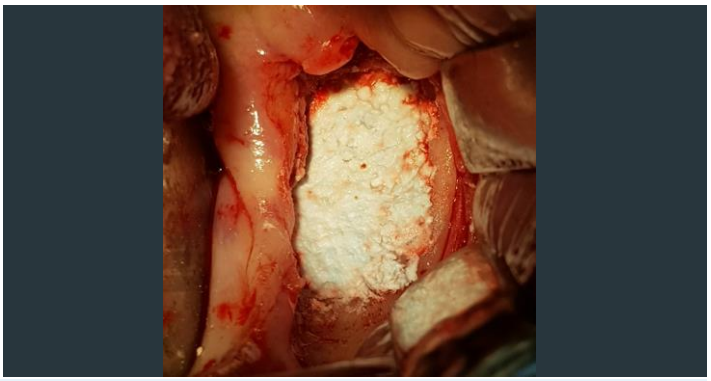
Visible cyst wall after flap opening



The bone defect after cyst removal, with bone curettage.

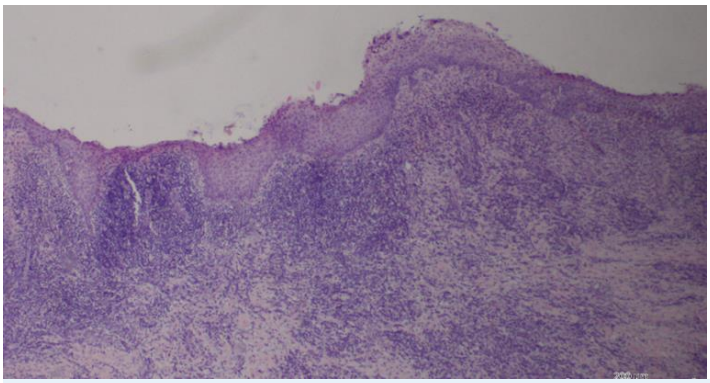


Diameter of the cyst.



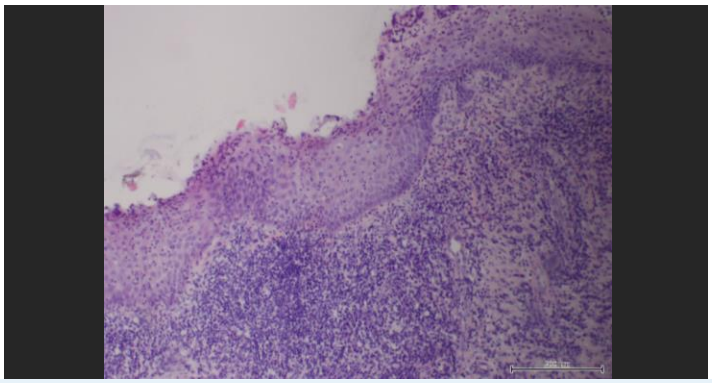
Bond Apatite® in the defect

CLINICAL EVIDENCE



Histological structure:

On top we see multilayer epithelium, connective soft tissue with many inflammatory cells around. Focus 40x, Hematoxylin & Eosin steaming.



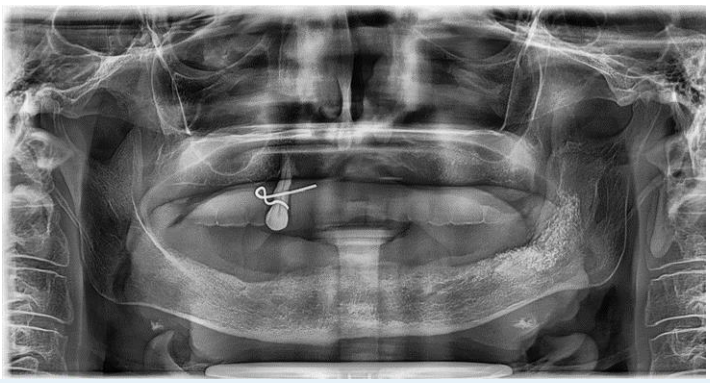
The same structure. Focus 100x, hematoxylin & Eosin steaming.

Sutures

Mucosa 7-days post-op

CLINICAL EVIDENCE

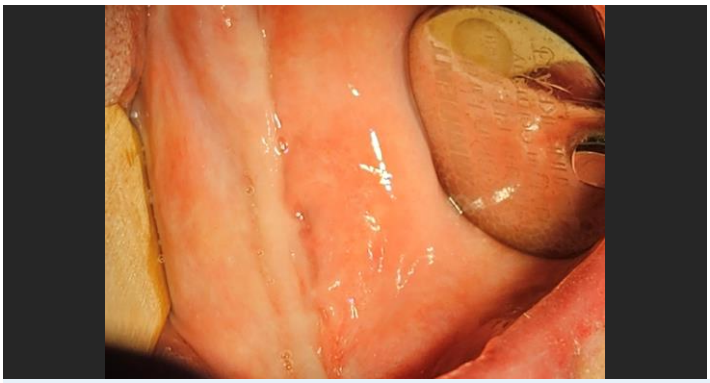
1-month post-op



3-months post-op

Mucosa 3-months post-op

CLINICAL EVIDENCE



Mucosa 4-years post-op

Radiography 4-years post-op

LEVEL II, CASE #2 | CASE DESCRIPTION

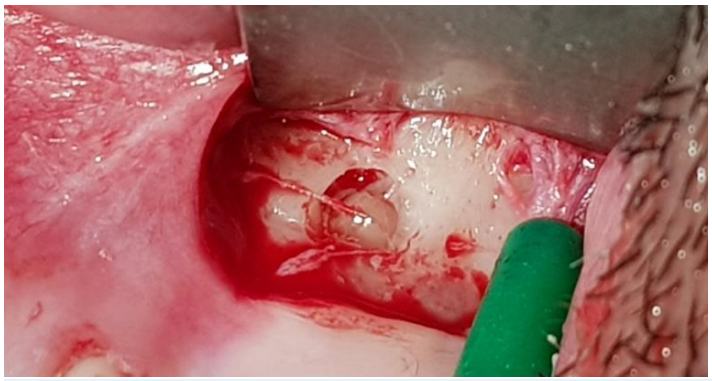
Endodontic Microsurgery of Tooth #26 (14)

- The patient is a healthy 42-year-old male.
- The conservative endodontic treatment of the tooth #26 (14) failed. He has intense pain and swelling from time to time, although the inflammation on the X-ray is so small and can only be seen around the buccal mesial root.
- Good healing and no clinical symptoms were observed 12 months post-op. The patient had only one day of pain and two days of swelling after the surgery. X-rays show how nicely the Bond Apatite® filled this bone defect and rebuilt into the patient's own bone. It's hard to fill this defect with autogenous bone or bovine granules.
- The treatment plan involved a root resection of this buccal mesial root of tooth #26 (14), backfilling with MTA and cyst enucleation with histopathology examination.
- The bone defect was filled with Bond Apatite®.

CLINICAL EVIDENCE

Visible inflammation around buccal mesial root of #26 (14).

Flap opening



Trepanation hole

Note the visible apex of the root.

Post apicoectomy back preparation

CLINICAL EVIDENCE

Back filling of the root canal with MTA

Bond Apatite® inside the bone defect

Sutures

7-days post-op

CLINICAL EVIDENCE

3-months post-op

12-months post-op

12-months post-op

LEVEL II, CASE #3 | CASE DESCRIPTION

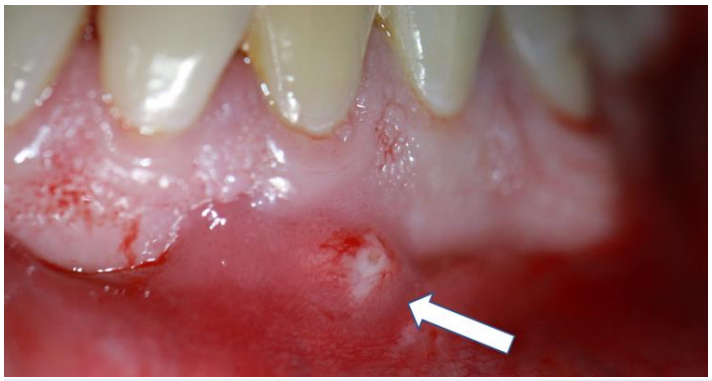
Large Cyst Enucleation, Apicoectomy with MTA Retrograde Filling and Bond Apatite®

- The patient is 40-year-old male presenting with a cyst in the front of the mandible, in the range of root #31 (24) and #32 (23).
- There was pain, swelling and active buccal fistula.
- The fistula disappeared spontaneously in two weeks. The patient's pain and discomfort disappeared completely with no clinical or pathological symptoms.
- Enucleation of the cyst and resection with retrograde and filling (MTA) of roots #31 (24) and #32 (23).
- Augmentation was done with Bond Apatite®.

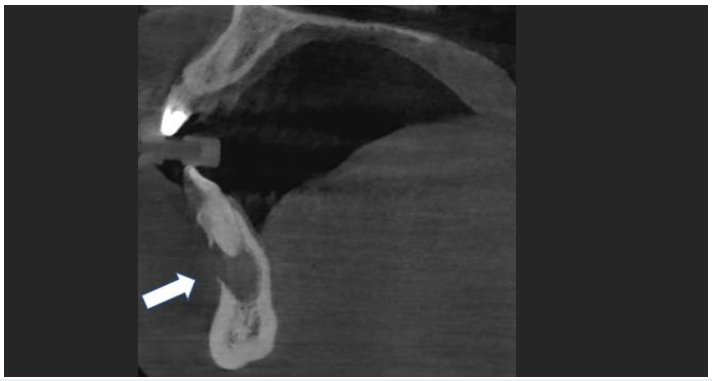
CLINICAL EVIDENCE

Initial radiography

Pre-op radiography

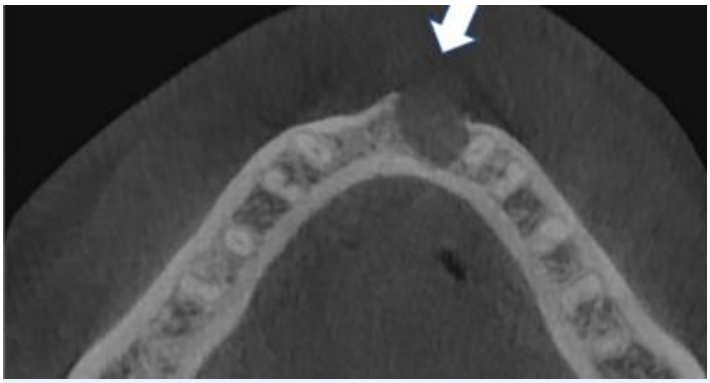


Large radiolucent lesion and active buccal fistula

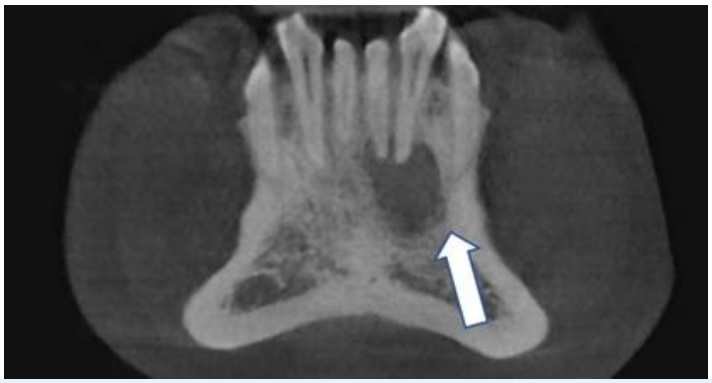


Pre-op CBCT

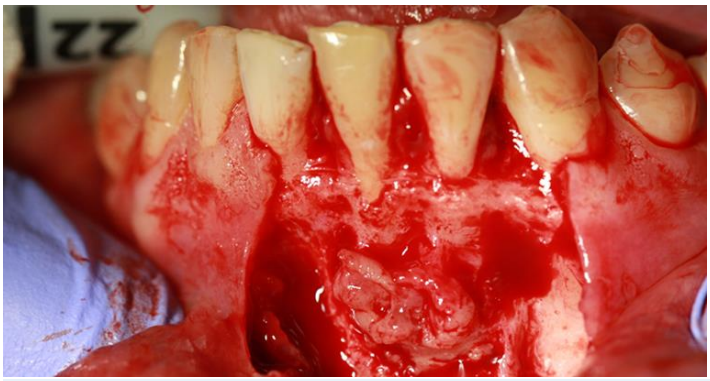
CLINICAL EVIDENCE



Pre-op CBCT



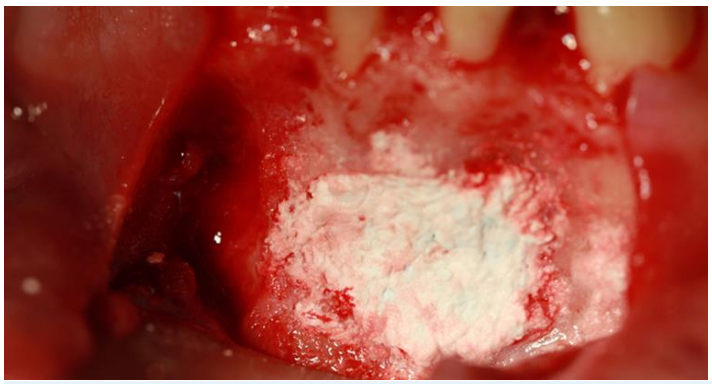
Pre-op CBCT



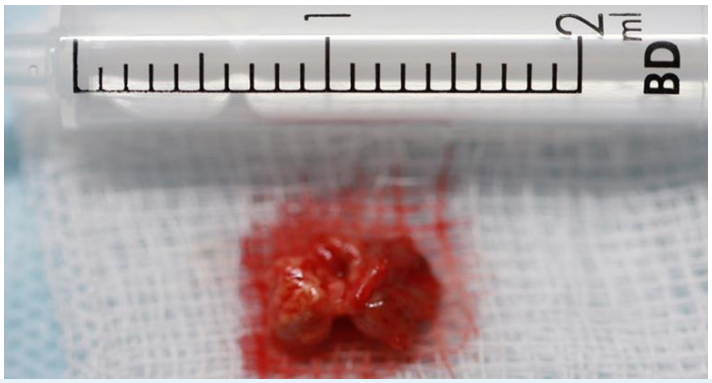
Surgery

Cyst enucleation

CLINICAL EVIDENCE



Bond Apatite® in place

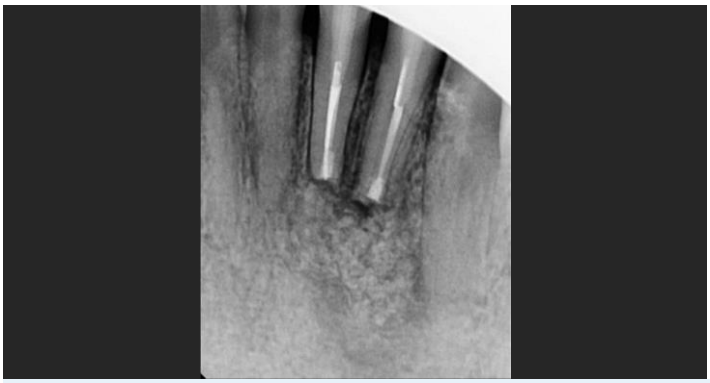


Cyst

1-week post-op

8-months post-op

CLINICAL EVIDENCE



8-months post-op

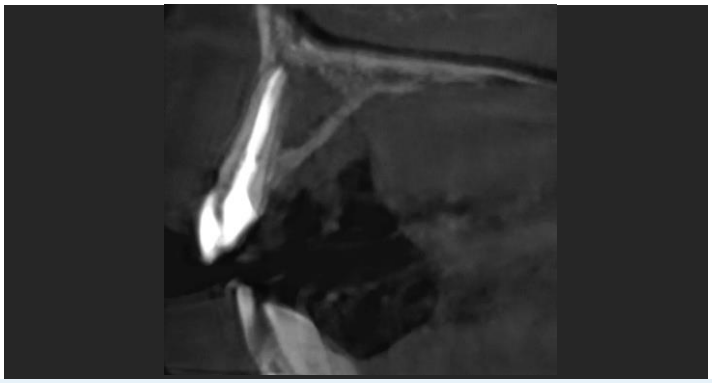
3-years post-op

Cyst of the Anterior Left Maxilla

- The patient is a healthy 42-year-old woman.
- The cyst appeared 8 months after good endodontic treatment.
- The patient had pain and discomfort for a few days.
- The treatment plan included a root resection of tooth #22 (10), followed by a cyst enucleation with histopathology examination.
- A kind of dedicated micro tool, similar to the Gracey curette, was used to remove part of the cyst from behind the root (from the palatal side). Without this tool it would have been much more difficult.
- The bone defect was then filled with Bond Apatite® (2cc).
- Good healing with no clinical symptoms were observed during 3 and 6 month follow ups.

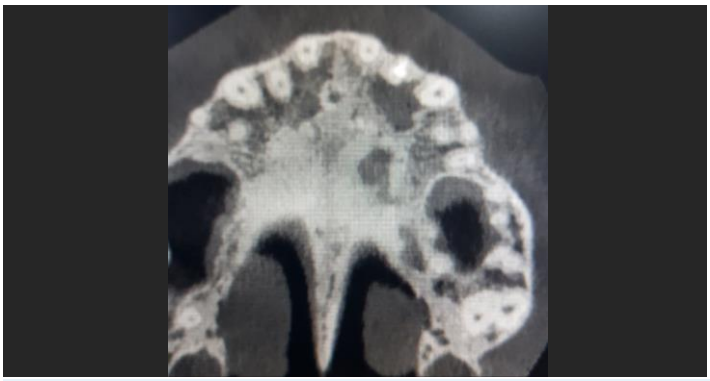
CLINICAL EVIDENCE

Cyst appears 8-months after successful endodontic treatment



CBCT

The cyst is growing to the palatal side more than one third of the root length.



Horizontal CBCT

After root resection of #22 (10)

CLINICAL EVIDENCE

Dedicated micro-tool, similar to gracey curette

Using the micro-tool, we can remove the cyst from behind the root.

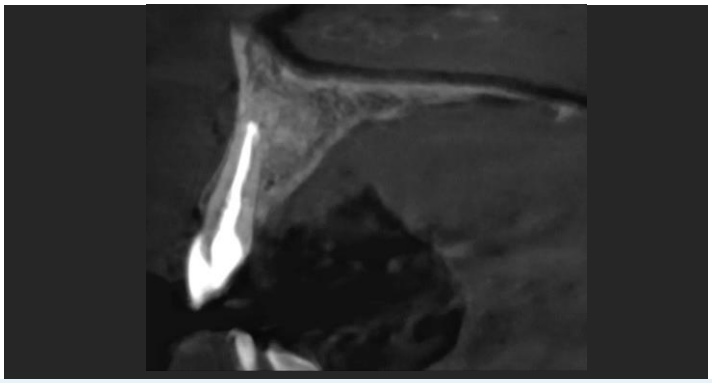
Bond Apatite® in place

Sutures

6-0 Nylon, reverse cutting needle, length 12 mm

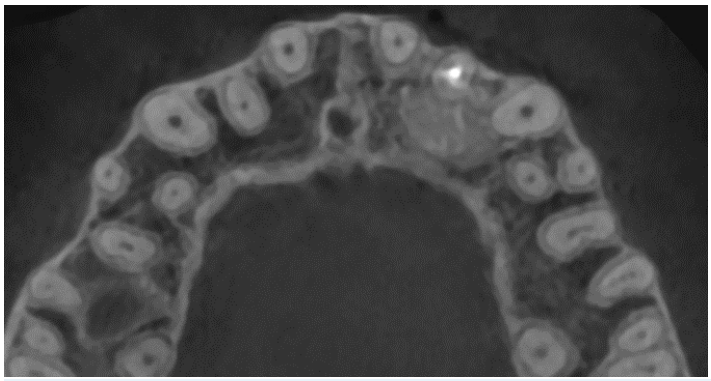
CLINICAL EVIDENCE

Mucosa 7-days post-op

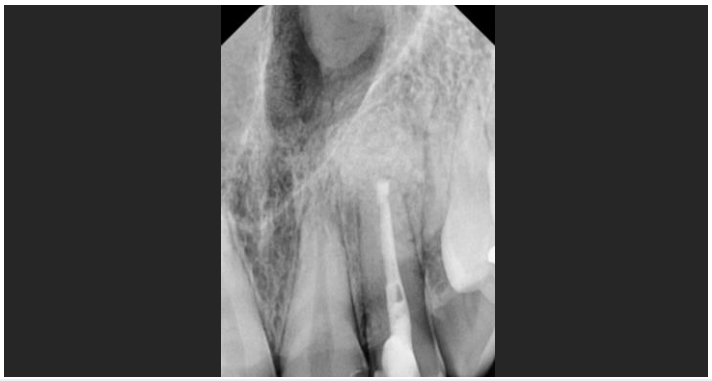


CBCT 3-months post-op

Completely visible restoration of the vestibular cortical lamina.



Horizontal CBCT, 3-months post-op



X-ray 6-months post-op

CLINICAL EVIDENCE

4-year follow up X-ray

LEVEL II, CASE #5 | CASE DESCRIPTION

Cyst Enucleation & Apicoectomy

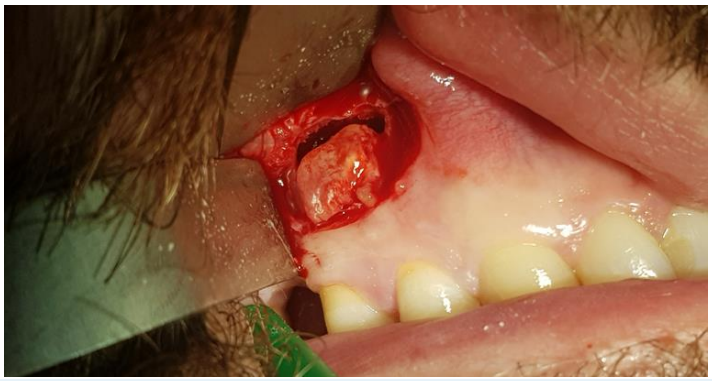
- The patient is a healthy, 30-year-old male.
- In the area of tooth #15 (4), there was an inflammatory lesion without any pain or other clinical symptoms. The patient did not want an apicoectomy of tooth #15 (4), and he returned with pain and swelling 6 months later.
- X-rays showed that a cyst had formed and there was necrosis of the pulp in tooth #14 (5).
- The treatment plan involved an endodontic treatment of #14 (5) and surgery.
- The radicular cyst was removed (with histopathology) and root resection was done on teeth #14 (5) and #15 (4) with retrograde MTA filling.
- We filled the bone defect with 1cc Bond Apatite®.
- The patient reported medium pain and discomfort in the first two days after surgery. Good healing and bone remodelling were observed 12 months post-op, without any inflammation.
- The patient reported no clinical symptoms.

CLINICAL EVIDENCE

Cyst in #14 (5) and #15 (4)

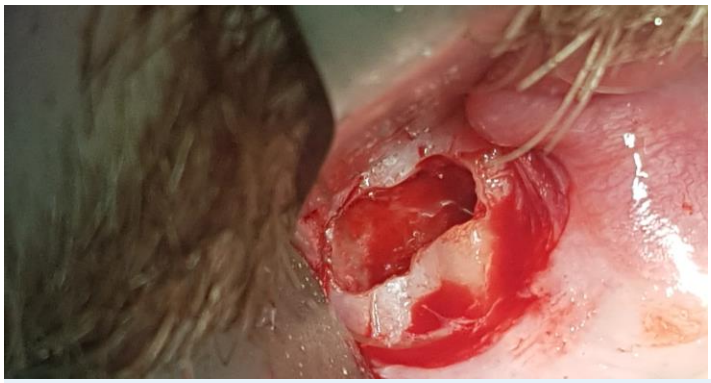
Pre-op X-ray

Local status 6 months after the patient didn't do the proposed apicoectomy. The cyst has grown.

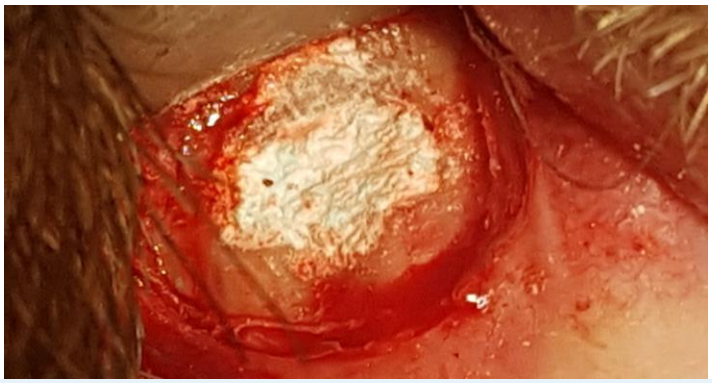


Flap opening showing the visible lesion

CLINICAL EVIDENCE



The bone defect after cyst removal and resection of roots #14 (5) and #15 (4).



Augma Bond Apatite® in place

Sutures, 6-0 nylon

X-ray 7-days post-op

CLINICAL EVIDENCE

X-ray 12-months post-op

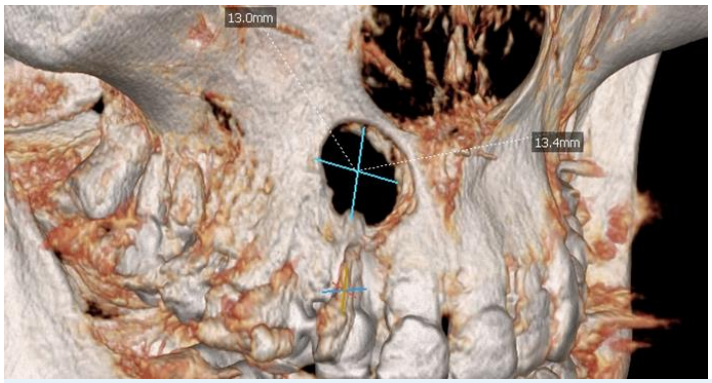
Mucosa 12-months post-op

LEVEL II, CASE #6 | CASE DESCRIPTION

Large Cyst of the Front Right Maxilla

- The patient is a 65 year old female with multiple health conditions (diabetes, post heart infarct with PCI - percutaneous coronary intervention, hypertonic pressure, atrial fibrillation including the chronic use of dihydroxycumarin derivatives and antiplatelet drugs).
- The cyst appeared 4 years after successful endodontic and prosthetic treatment. The first clinical symptom was an abscess.
- The treatment plan started with draining the abscess.
- Three weeks after the abscess incision, we completed a one step endo-surgery treatment with a root resection of tooth #12 (7), cyst enucleation (with histopathology examination), and backfill of the root canal with MTA.
- In addition, we used dedicated microtools and then filled the bone defect with Bond Appetite® (2 cc).
- Good healing and no clinical symptoms were observed throughout a 2 year follow-up period.
- All procedures were completed with continuation of anticoagulation drugs. No bleeding after surgery was observed.

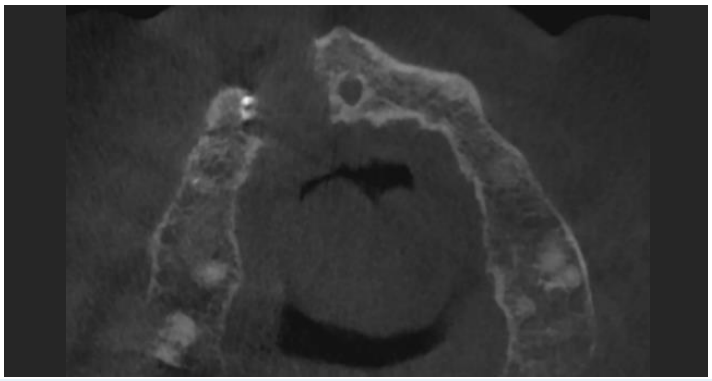
CLINICAL EVIDENCE



Pre-op 3D scan showing a cyst in the right maxilla. There is total damage to both laminas.

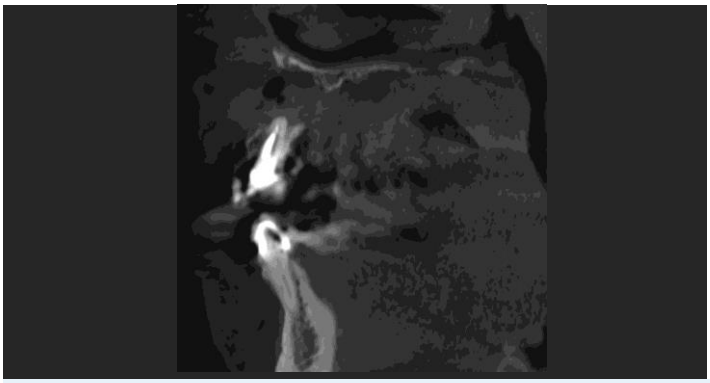
The first clinical symptom was an abscess.

3-days post abscess drainage



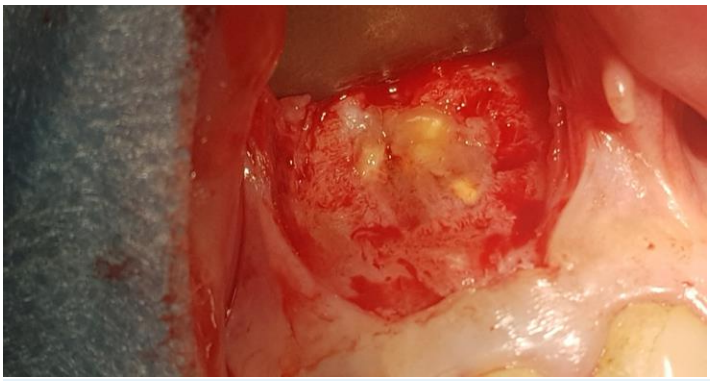
CBCT horizontal scan showing visible lesion of the buccal and palatal plates.

CLINICAL EVIDENCE



CBCT lateral scan

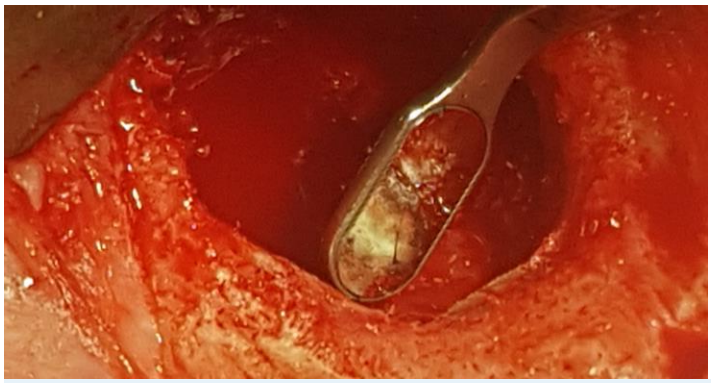
Initial aspect showing no possibilities for endodontic treatment.



After flap opening, the structure of the cyst is visible.

Post cyst removal and apicoectomy of tooth #12 (7).

CLINICAL EVIDENCE



Backfill of root #12 (7) canal with MTA

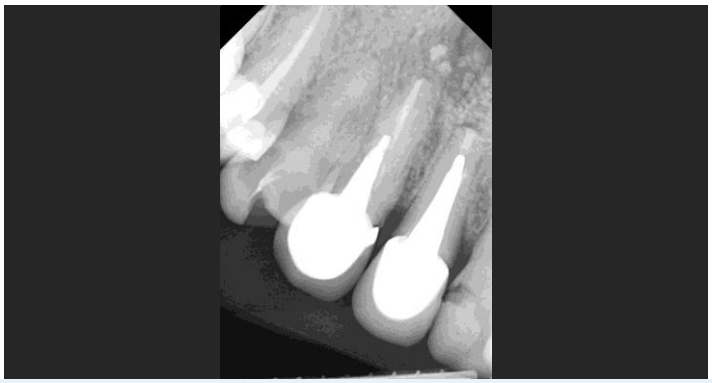
Bond Apatite® inside the bone defect (2cc)

Sutures 6-0 nylon, reverse cutting needle, length 12 mm

Mucosa 7-days post-op

CLINICAL EVIDENCE

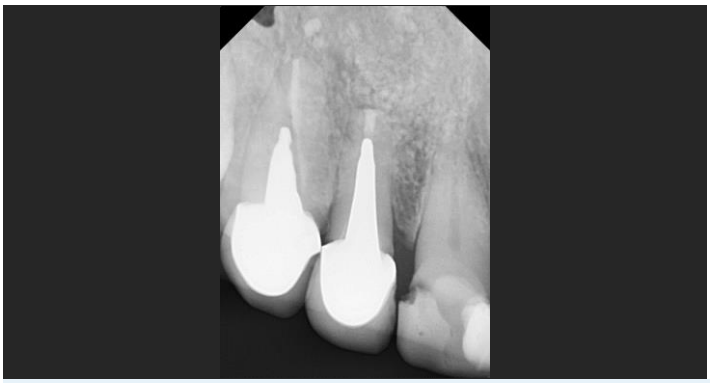
Control X-ray 7-days post-op



Control X-ray 3-months post-op

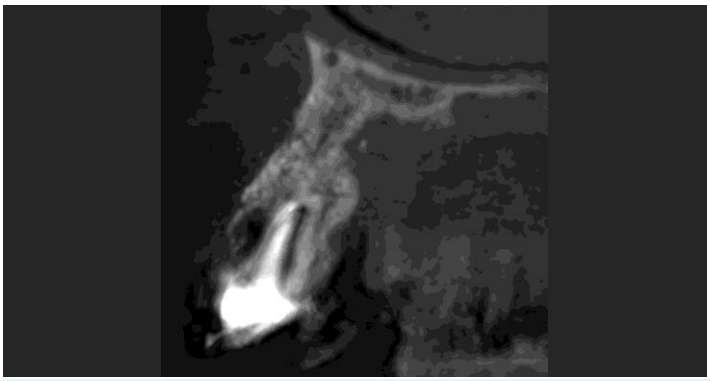
Mucosa 3-months post-op

CLINICAL EVIDENCE



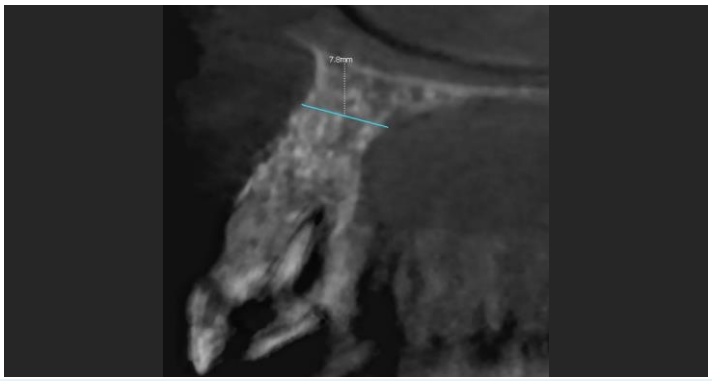
Control X-ray 2-years post-op

Mucosa 2-years post-op



CBCT 2-years post-op

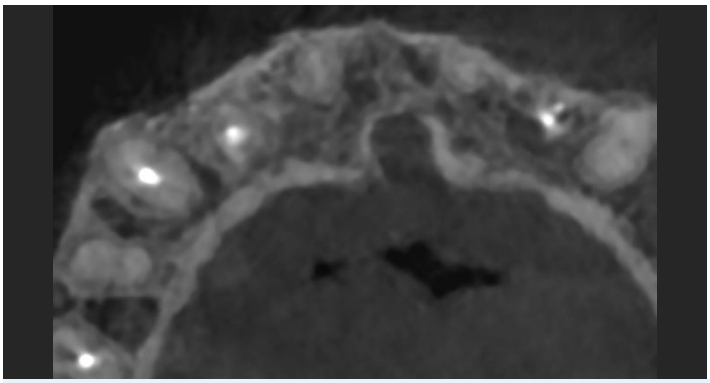
Regulation of both laminas



CBCT 2-years post-op

Regulation of both laminas

CLINICAL EVIDENCE



CBCT 2-years post-op

Regulation of both laminas

X-ray 3-years post-op

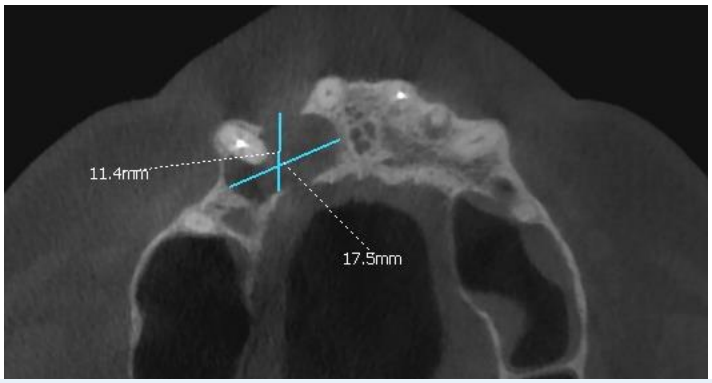
LEVEL II, CASE #7 | CASE DESCRIPTION

Cyst of the Right Maxilla and Prosthetic Restoration

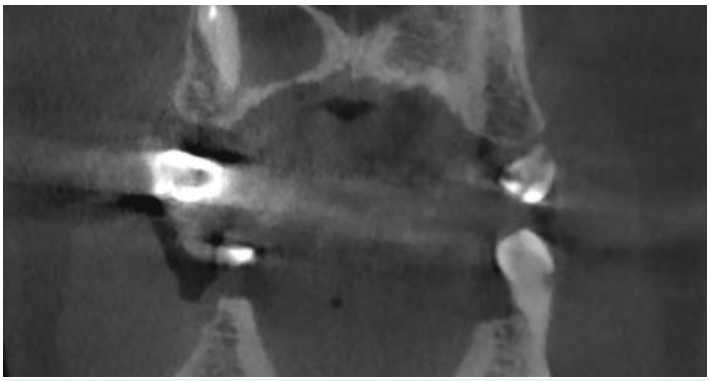
- The patient is a healthy, 42-year-old male.
- The cyst appeared after many years of endodontic treatment in area of #13 (6) and prosthetic treatment in the area of #12 (7) - #15 (4).
- The first clinical symptom was a swollen abscess.
- There was a complication due to a broken microsurgery tip used in preparation of the root canal, which was left inside the right sinus.
- 6 weeks after the abscess incision, we did a one step endo-surgery treatment with a root resection of tooth #13 (6), cyst enucleation (with histopathology examination) and backfill of the root canal with MTA.
- In addition, we performed a microsurgery because of little changes around root #22 (10), which included an apicoectomy, backfill and graft with Bond Apatite®. The bone defect was filled with Bond Apatite® (2 cc).
- Good healing and no clinical symptoms were observed during the
- 2-year follow-up period. Moreover, no sinus inflammation was observed.

CLINICAL EVIDENCE

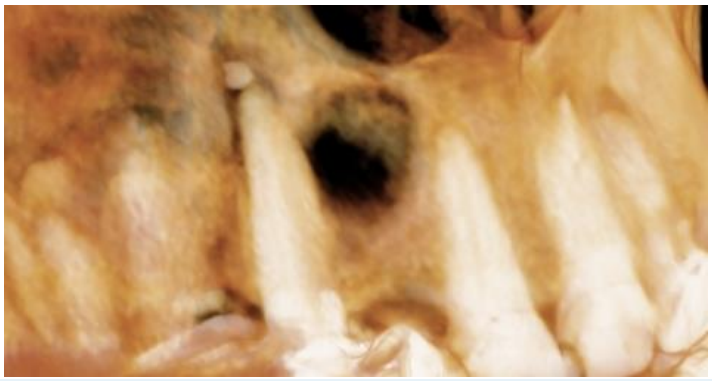
Pre-op X-ray



Pre-op CBCT showing the range of the cyst.

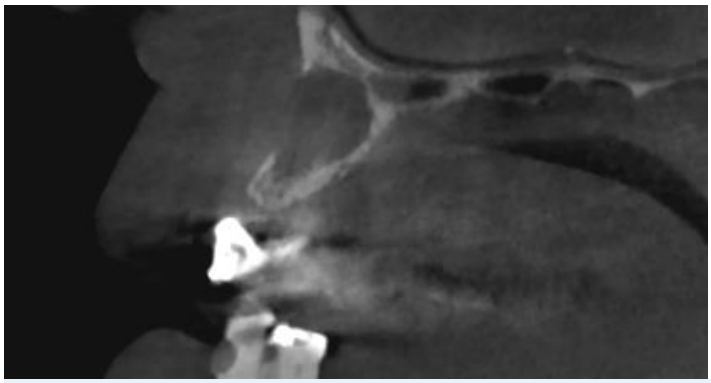


Frontal CBCT

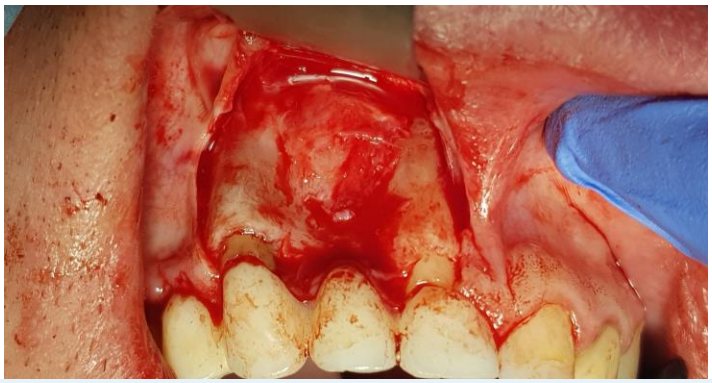


3D CBCT showing visible damage of the palatal plate.

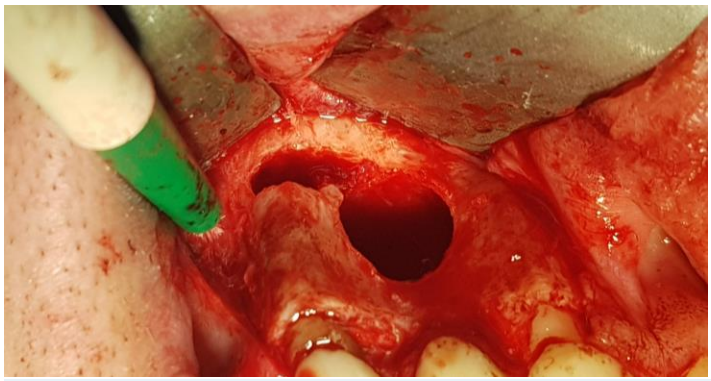
CLINICAL EVIDENCE



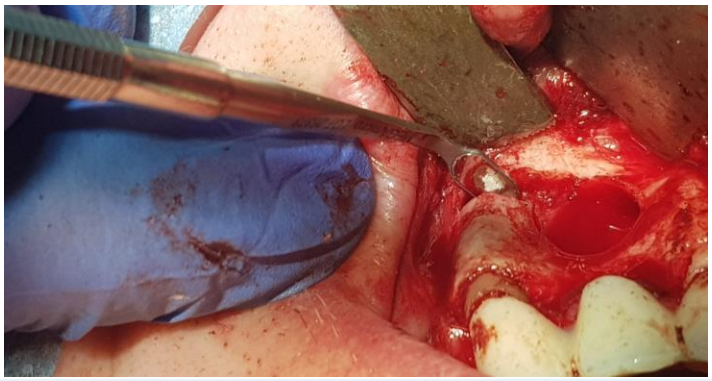
CBCT showing partial damage of the buccal plate



After soft tissue preparation, the cyst wall is visible



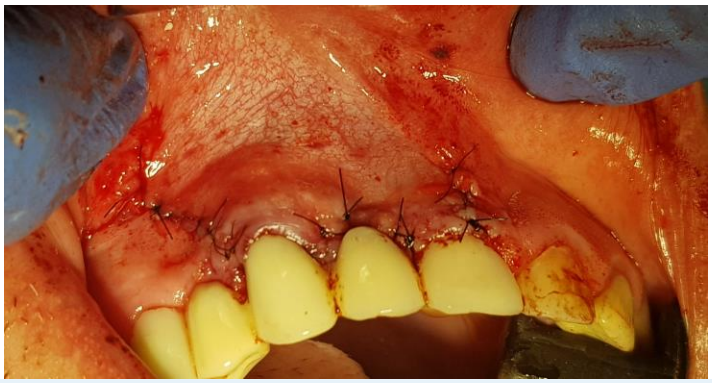
Bone defect after cyst removal



Backfill of the root canal #13 (6) with MTA

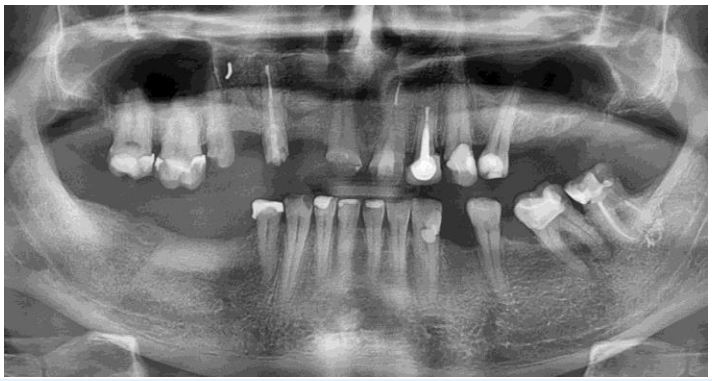
CLINICAL EVIDENCE

Bond Apatite® inside the defect (2cc)



Sutures

Mucosa 7-days post-op



Panoramic 7-days post-op showing good primary stability of the graft. The broken backfill tip is visible inside the sinus.

CLINICAL EVIDENCE

Panoramic 2-years post-op

The implantology treatment will be continued in the lateral right mandible.

Mucosa 2-years post-op

Good looking gingiva with new prosthetic restoration.

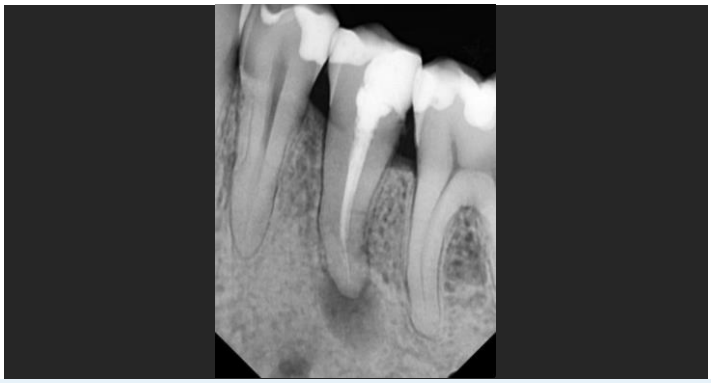
LEVEL II, CASE #8 | CASE DESCRIPTION

Endodontic Surgery: Apicoectomy #35 (20) with Cyst Removal and Bond Apatite®

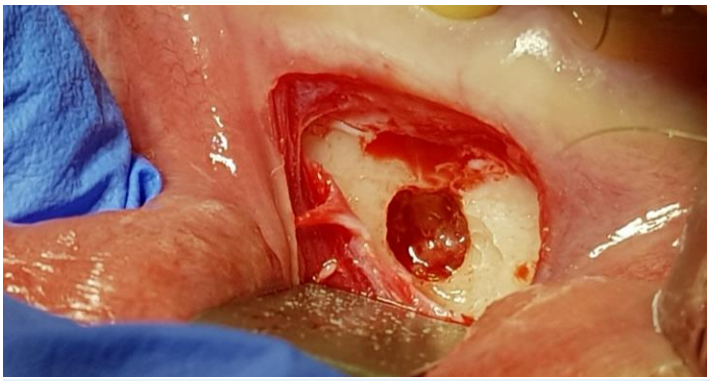
- Healthy male, age 32 years. The cyst is not involved after 5 months of endodontic treatment. He has pain and discomfort from time to time.
- A root resection was made of tooth #35 (20) with back-fill with the MTA, cyst enucleation (confirmed with histopathology examination). We filled the bone defect with Bond Apatite® (1/2 cc).
- During the surgery we observed, how nice the Bond Apatite® filled this bone defect, because it`s take a more time and it`s much more difficult to fill it with traditional augmentation techniques.
- Good healing and no clinical symptoms after six months was observed. Only two days of pain after surgery and little swollen.

CLINICAL EVIDENCE

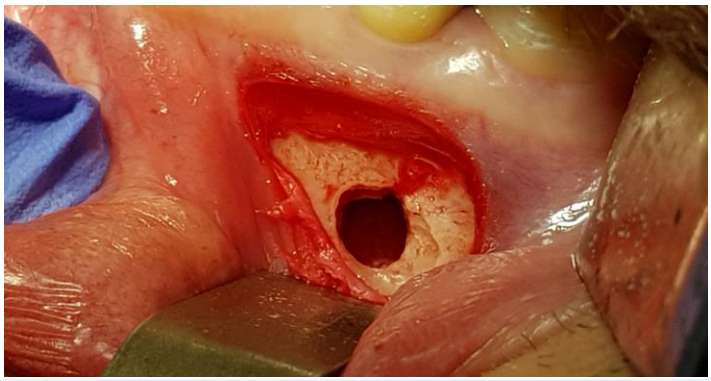
Panoramic before surgery



Another X-ray before surgery

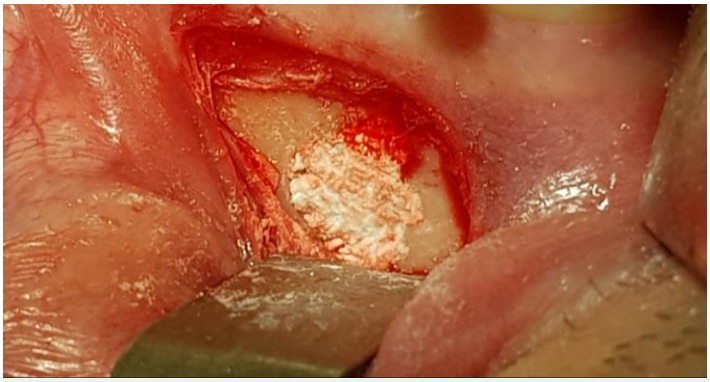


After flap opening and trepanation hole



After cyst removal

CLINICAL EVIDENCE



Bond Apatite® inside the bone defect

Sutures

X-ray 7-days post-op

X-ray 3-months post-op

CLINICAL EVIDENCE

X-ray 6-months post-op

X-ray 3-years post-op

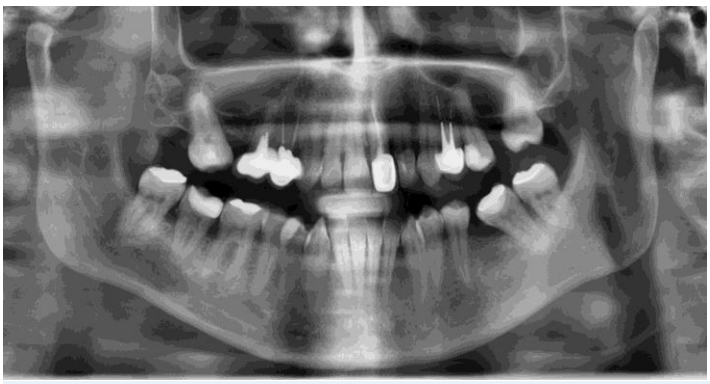
Mucosa 3-years post-op

LEVEL I!, CASE #9 | CASE DESCRIPTION

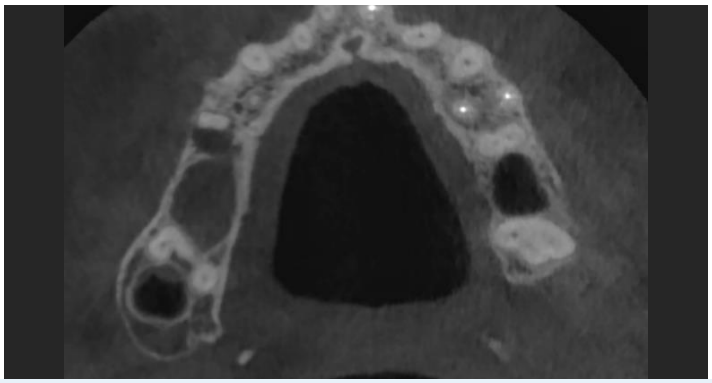
Cyst of the Lateral Maxilla

- The patient is a healthy, 46-year-old female.
- An inflammatory lesion located in the position of tooth #15 (4), which caused pain and other clinical symptoms.
- The tooth had prosthetic restoration with a crown that was attached to another crown on tooth #14 (5).
- The treatment included an apicoectomy of tooth #15 (4).
- A one-stage microsurgery is done with radicular cyst removal with histopathology, root resection of tooth #15 (4) with retrograde MTA filling.
- The defect is filled with 1 cc Bond Apatite®
- Both cortical laminas were damaged during the surgery.
- The buccal wall was damaged by the trepanation hole, and the sinus side was destroyed from reactive inflammatory changes in the sinus.
- The cortical lamina side was reconstructed 4 months post-op.
- 4-year follow-up showed good remodeling of the bone and soft tissue healing.
- 4-year follow-up CBCT confirmed the stability of regenerated cortical laminas.

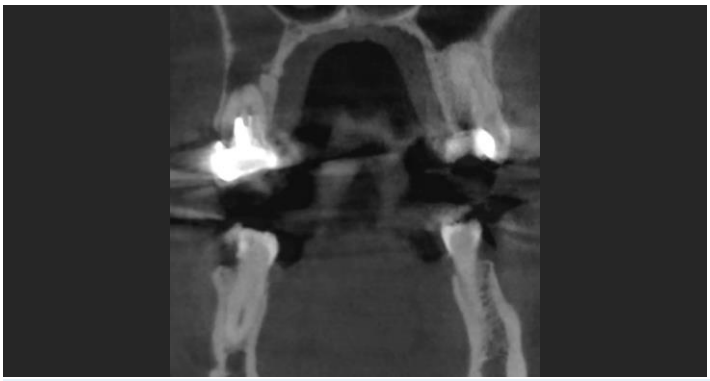
CLINICAL EVIDENCE



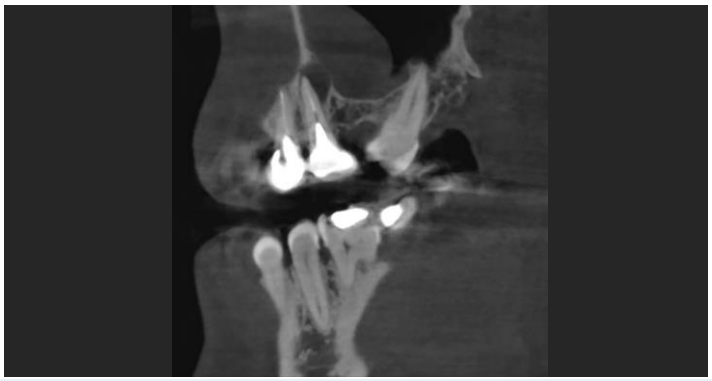
Cyst around root #15 (4)



CBCT of the cyst

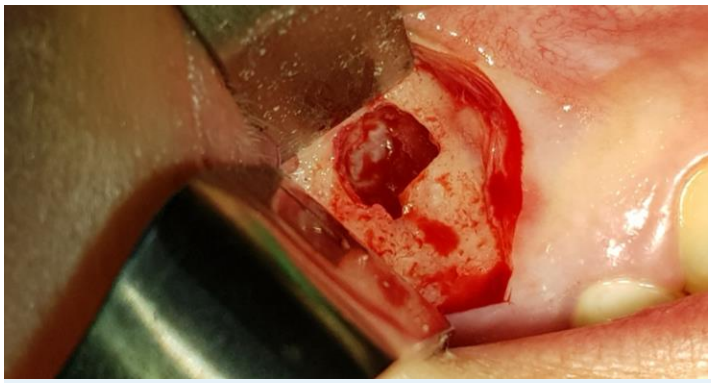


Inflammatory damage of the cortical lamina from the sinus.



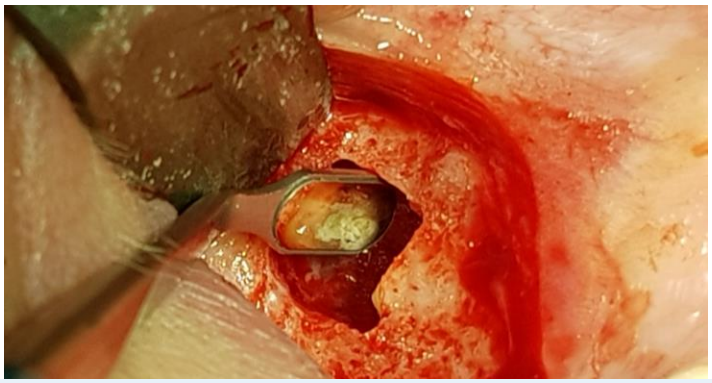
Damage of the cortical lamina and reactive inflammatory changes in the right sinus.

CLINICAL EVIDENCE



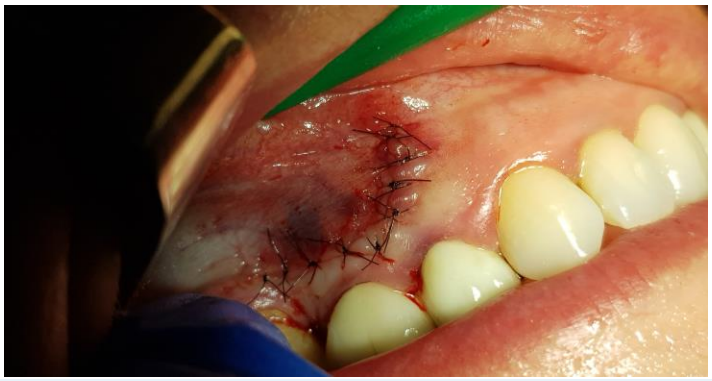
The defect after root resection of #15 (4).

Inside the defect, the intact sinus mucosa is visible.



Backfill of both canals with MTA.

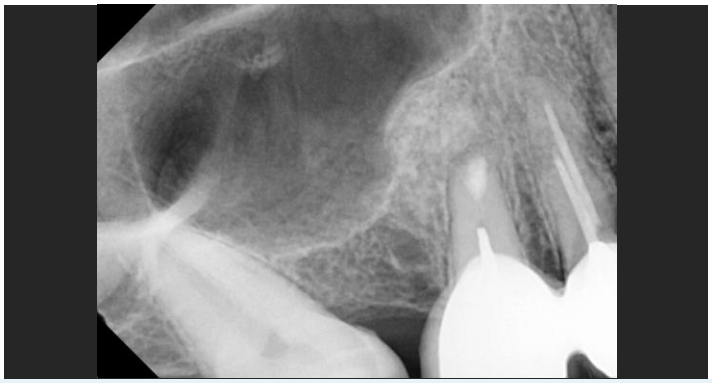
Bond Apatite® in place



Sutures

CLINICAL EVIDENCE

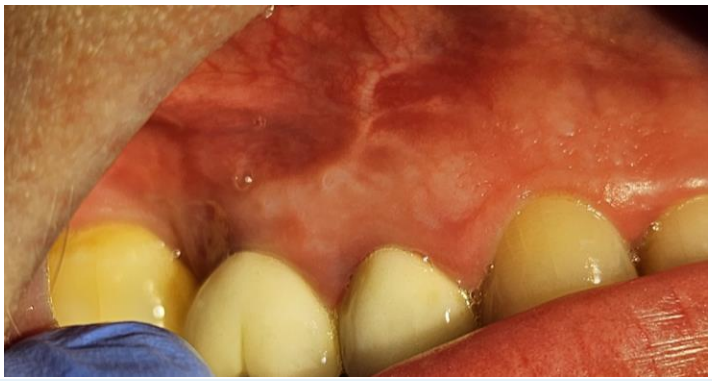
Mucosa 7-days post-op



4-months post-op

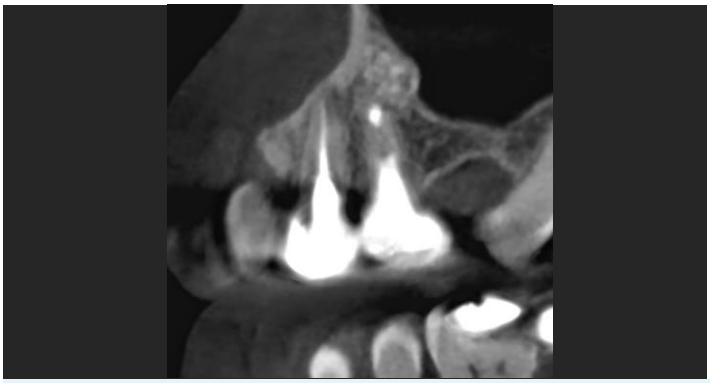
Cortical lamina of the sinus is regenerated

4-years post-op



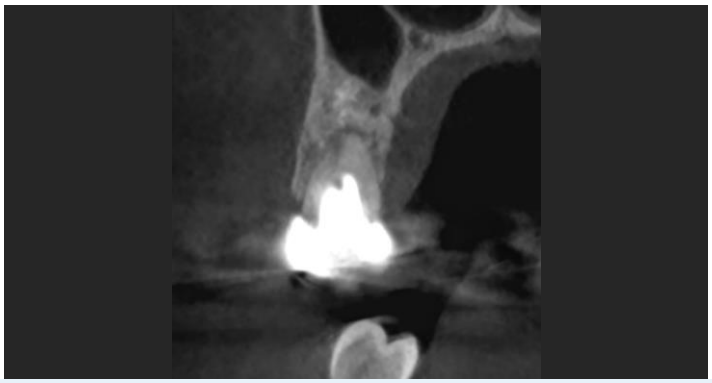
4-years post-op

CLINICAL EVIDENCE



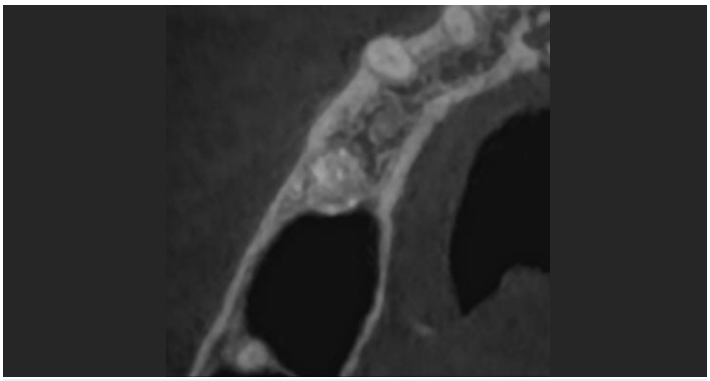
4-year post-op CBCT

Visible regeneration of the cortical lamina with no inflammation.



4-year post-op CBCT

Both cortical laminas are stabile and fully regenerated.



4-year post-op CBCT

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LARGE CYSTS & BENIGN TUMORS

Level III | Evaluation and Planning
One-Stage Treatment of Small Tumors

- Evaluation:
- Evaluation of X-ray images.
- Determine the dimensions of the lesion.

- CBCT images are used to evaluate the anatomical position of the tooth in relation to other structures, such as the maxillary sinus, inferior alveolar nerve and adjacent teeth.
- Evaluation of the tumor for infiltration, one or multi- chamber view inside.
- It is very important to define the amount of damage to the bone around the cyst or tumor.
- If a large tumor structure has a one chamber view inside, then it's possible to consider a Two-Stage treatment with decompression of the tumor. A sample is taken for histopathology diagnosis and an overdenture/obturator is placed for the next 9 months.
- If a small tumor has a multi-chamber view, bone septum or internal layers, and some kind of infiltration of the spongy or cortical bone or soft tissue outside is visible, it's possible to plan a one-step treatment. First it`s necessary to do the reconnaissance revision including taking a part of the tumor to histopathology. If there is any liquid inside the lesion is, the cytology is also important and recommended.

Level III | Evaluation and Planning
One-Stage Treatment of Small Tumors

- Planning the procedure:
- It is recommended to use standard oral surgery instrument. Kim-Pecor retractors are not necessary but could be used if they help in a specific clinical situation.
- Any position of the patient on the treatment chair can be used. The clinician chooses the best position for doing the decompression based on location and access to the lesion.
- One assistant is recommended.

Level III | Step-By-Step
One-Stage Treatment of Small Tumors

- Treatment of the small tumors in one step is similar to previous levels with some additional steps.
- Incisions are made at the discretion of the clinician. It is important that the incision lines are located beyond the range of the future bone defect.
- After dissecting the mucoperiosteal flap, make a trepanation ostetomy in the external cortical plate at the level of the tooth root apex. In cases where there is a pre-existing hole in the bone plate from a pathological lesion, prepare the already existing hole.
- The osteotomy is made with a surgical micromotor, using carbide drills or a piezo device. The access should be at a proper size to see the operation area.
- Next, dissect the tumor wall or other structures from the hard tissues using bone microcurretes and exposing the tip of the tooth root. Resect no more than 3 mm perpendicularly to the long axis of the root.
- Peripheral bone curettage around the defect up to 2 mm deep, using hand tools and mechanical devices such as surgical micromotors, piezo sect.

Level III | Step-By-Step
One-Stage Treatment of Small Tumors

- The next stage is the preparation of the root canal, and possible additional canals, using a piezo device and dedicated diamond tips to a depth of 3 mm. The prepared canal should be filled with a dedicated cement, for example Pro Root MTA (Mineral Trioxide Aggregate).
- After obtaining the compactness of the filled canal, we proceed to augmentation of the bone defect with Bond Apatite® according to the bone cement protocols. (add link)
- After compacting the biphasic calcium sulfate in the bone defect according to Augma protocols, suture the wound. It is recommended to use monofilament sutures, non-resorbable, sizes 5-0 to 6-0.
- It is very important not to cut the periosteum for the purpose of extending the flap.
- If necessary, use pharmacotherapy (antibiotics, analgesics) and anti-edematous dexamethasone in a decreasing dose of 8 to 2 mg for the next 4 days.
- One-week post-op the stitches are removed and follow up X-rays are done to determine the shape of biomaterial in the bone defect.
- Follow up visits will be done 3- and 6-months post-op, and twice a year for the five years following the procedure.

Level III | Evaluation and Planning
Two-Stage Treatment of Large Tumors

- Step one - decompression of the tumor.
- Evaluation of X-ray images.
- Determine the dimensions of the lesion.
- CBCT images are used to evaluate the anatomical position of the tooth in relation to other structures, such as the maxillary sinus, inferior alveolar nerve and adjacent teeth.
- CBCT is used for primary examination for planning the decompression.

- Planning the procedure:
- It is recommended to use standard oral surgery instruments. Kim-Pecor retractors are not necessary but could be used if they help in a specific clinical situation.
- Any position of the patient on the treatment chair can be used. The clinician chooses the best position for doing the decompression based on location and access to the lesion.
- One assistant is recommended.

Level III | Step-By-Step
Two-Stage Treatment of Large Tumors

- The incision is made at the discretion of the clinician. However, it is important that the incision is above the cyst wall and top of the ridge if possible. In the future there will be an obturator with overdenture or part-device such as an orthodontic appliance. It is important to choose a location for the incision where it is easy to take a sample for histopathology and for drainage fixation.
- First cut through the mucosa, connective tissue and cyst wall. Take samples to cytology for histopathology including sections of the cyst wall, and if possible, also the liquid from inside the cyst, to find any neo plasmatic cells.
- The drain is inserted inside the cyst through the hole and fixed with standard stitches (for example nylon 3-0 or 4-0) for 7 to 10 days. The drain can be a prepared part of sterile tracheal tube or urinary catheter, as both have x-ray markers to control the position of drainage inside the defect.
- Follow up visits should be done every day, and decontamination and rinsing of the cyst inside with antiseptics.
- After 7 to 10 days when the tissue epithelized, the stitches can be removed but the drain should be left inside.

Level III | Step-By-Step
Two-Stage Treatment of Large Tumors

- Impressions are done with a standard prosthetic spoon, and recommended impression material such as Impregum Penta or any similar silicone impression material. Material from a dedicated syringe is placed into the drain, the rest into the spoon, and after mass concentration the drain will be taken out with the impression in right position. Then the overdenture can be done in the typical process.
- Next, the patient should use the overdenture at all times during next 9 months.
- Follow up X-rays are recommended once a month. Progress of the treatment is closely observed. In addition, do not wait more than 9 months, as some studies (August M, Faquin WC, Troulis MJ, Kaban LB. Dedifferentiation of odontogenic keratocyst epithelium after cyst decompression. J Oral Maxillofac Surg 2003; 6: 678-683) recommended 9 months follow-up in first stage of large keratocysts Two-Stage treatment. The authors suggest that maintaining the obturators longer than 9 months may initiate the remodelling of the histological structure of the cyst towards more dangerous odontogenic tumors.

Level III | Step-By-Step
Two-Stage Treatment of Large Tumors

- By clinical control, if the patient feels pressure while using the prosthesis, the obturator should be shortened.
- Second stage begins 9 months later with the removal of the rest of the cyst after decreasing its diameter.
- Step two-removal of the large tumors.
- The incision is made at the discretion of the clinician. However, it is important that the incision is located beyond the range of future bone defects and goes through the epithelized hole for obturator.
- After dissecting the mucoperiosteal flap, prepare the trepanation hole in the external cortical plate around the position of obturator. The hole is made with a surgical micromotor, using carbide drills or a piezo device. The hole must be slightly larger to ensure good visibility of the operation area.
- Next, separate the cyst wall from the hard tissues using bone microcurretes, Lucas curretes and raspatory. The rest of the cyst should be sent for histopathology examination and compared with the first sample.
- Peripheral bone curettage around the defect up to 2 mm deep is done using hand tools and mechanical devices such as surgical micromotors, piezo sect.

Level III | Step-By-Step
Two-Stage Treatment of Large Tumors

- The histological and biological structure of the lesion after 9 months remains unknown, and so it is important to do the optimal radicalism to eliminate satellite microtumors (for example) in case the tumor has changed to another type of tumor.
- For the last step, proceed to augmentation of the bone defect with Bond Apatite® material, according to the protocols. (add link)
- After compacting the material in the bone defect according to Augma protocols, suture the wound with monofilament sutures, non-resorbable, sizes 5-0 to 3-0.
- It is very important not to cut the periosteum for the purpose of extending the flap.
- If necessary, use pharmacotherapy (antibiotics, analgesics) and anti-edematous dexamethasone in a decreasing dose of 8 to 2 mg for the next 4 days.
- One-week post-op the stitches are removed and follow up X-rays are taken to determine the shape of biomaterial in the bone defect.
- Follow up visits will be done 3-, 6- and 12-months post-op as well as once a year for a five-year follow-up period.

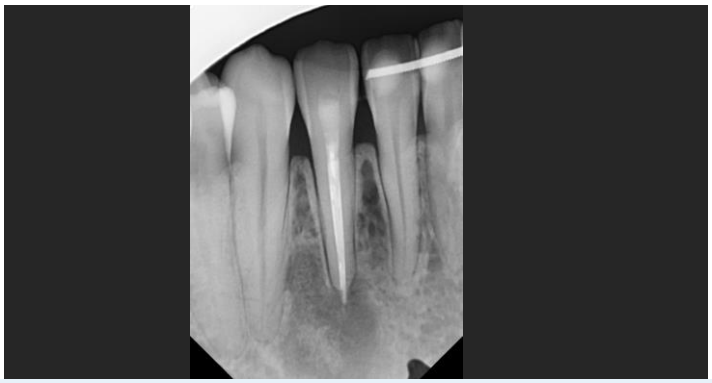
LEVEL III, CASE #1 | CASE DESCRIPTION

Central Ossifying Fibroma of the Anterior Mandible

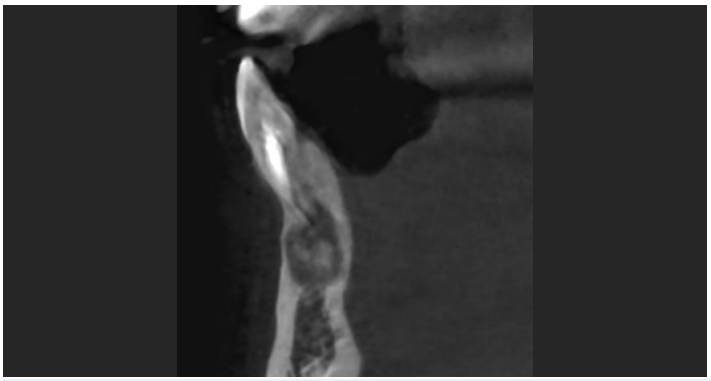
- The patient is a 26-year-old female.
- The first symptom presented in the right side of the front mandible, as pain of tooth number #42 (26) like in pulpitis.
- After endodontic treatment, the X-rays and CBCT showed a focus of osteolysis with strongly shaded elements in the central area.
- A root resection of #42 (26) was performed with backfill of the root canal with MTA. The tumor was removed with peripheral bone curettage about one millimeter deep and the bone defect was filled with Bond Apatite® (1cc).
- The tumor seemed to be between spongiosa and inflammatory bone, and after histology the diagnosis came back of a central ossifying fibroma of the mandible, COF.
- Good healing of the wound was observed. The sutures were removed after 7 days. Moreover, after 3 months no recurrence or secondary inflammatory symptoms were observed).

CLINICAL EVIDENCE

Focus of osteolysis in the area of the tooth #42 (26) (after endodontics)



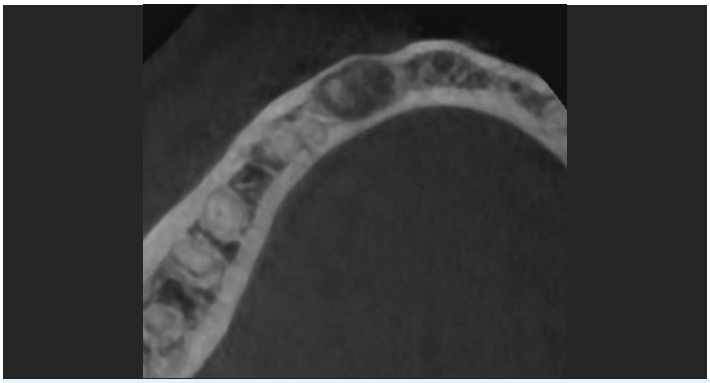
Irregular structure of the bone



CBCT-strongly shading elements surrounding by inflammatory like lesions

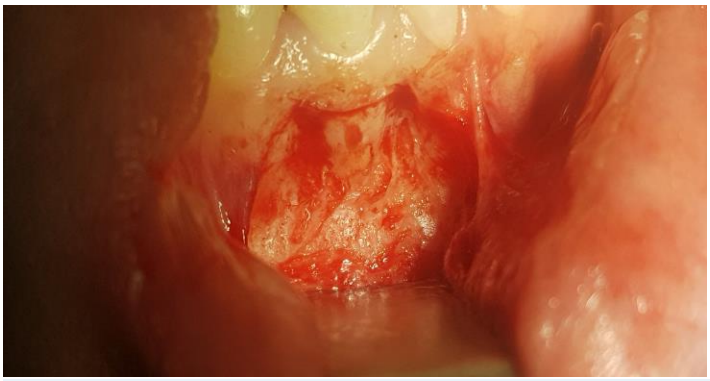
CBCT-the root of the tooth #42 (26) is inside the lesion

CLINICAL EVIDENCE



CBCT - horizontal section

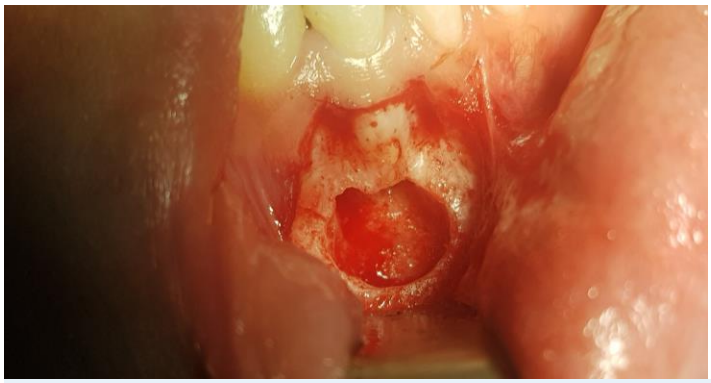
Perforation of the external lamina by the tumor



After flap opening

After trepanation hole - structure of the tumor

CLINICAL EVIDENCE



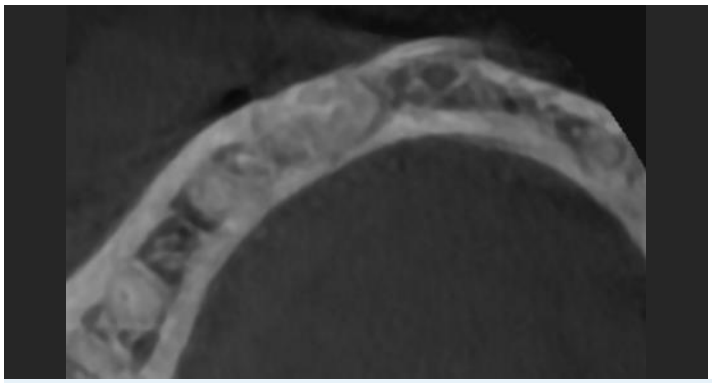
Bone defect

Bond Apatite® inside the defect

Sutures

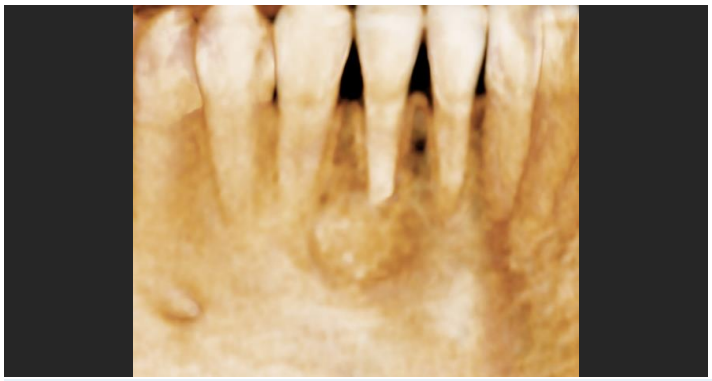
Control CBCT showed good filling of the bone defect with Bond Apatite®

CLINICAL EVIDENCE

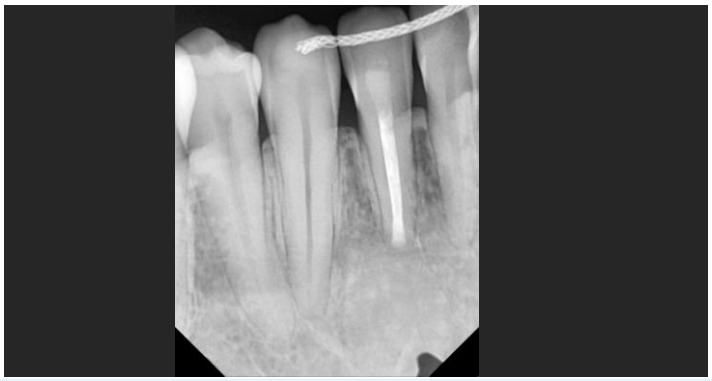


Horizontal CBCT

Mucosa after 7 days



3D reconstruction



Follow up 3-months post-op

CLINICAL EVIDENCE

Follow up X-ray, 18-months post-op

Mucosa 18-months post-op

LEVEL III, CASE #2 | CASE DESCRIPTION

Central Odontogenic Fibroma & Central Osteoma of The Mandible

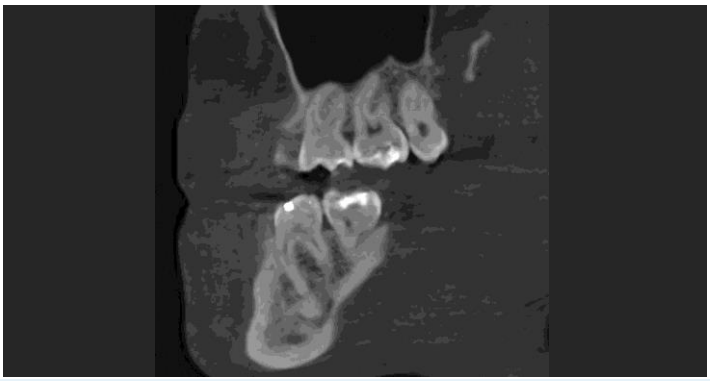
- The patient is a healthy 29-year-old female.
- The tumor developed without any clinical symptoms for about 2 years.
- Changes at the cellular level led to pulpitis and pulp necrosis of tooth #46 (30).
- The endodontic treatment was not carried out correctly, due to significant obliteration of the root canals #46 (30). A revision of the area #46 (30) was made, and the tumor was removed. It was highly mineralized, similar to osteoma and granulation tissue from the surrounding areas.
- A root resection of tooth #46 (30) was performed with retrograde filling of the root canals using MTA.
- The bone defect was filled with Bond Apatite® (1 cc).
- The histopathological study showed the presence of an odontogenic fibroma structure in the granulation tissue, and an osteoma in mineralized area.
- Good healing of bone and soft tissue was observed in 2-year follow-up.

CLINICAL EVIDENCE

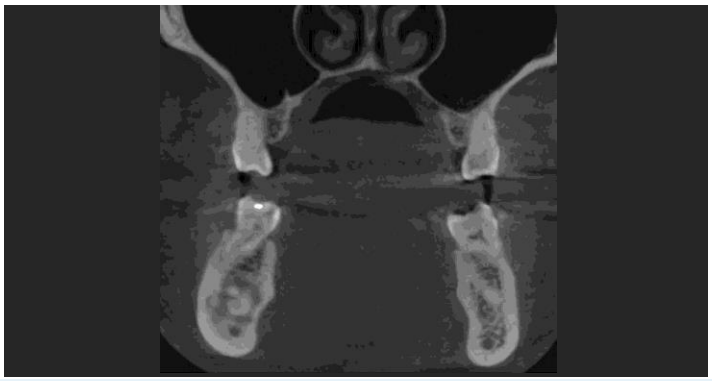
Panoramic

Visible changes of the bone structure in area of #46 (30) - #47 (31).

Confirmation X-ray showing a visible, highly mineralized part in the middle of the tumor.



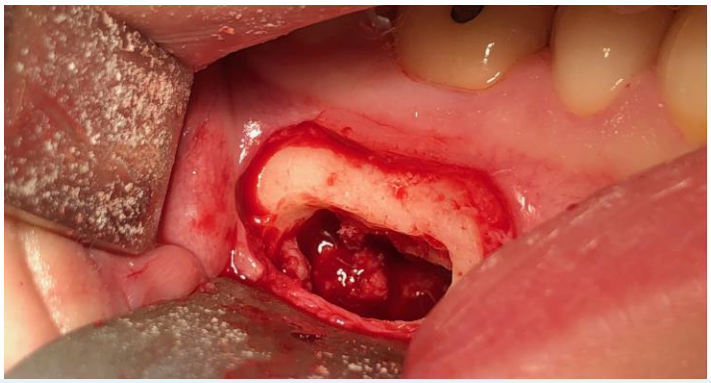
CBCT confirmation of the panoramic view



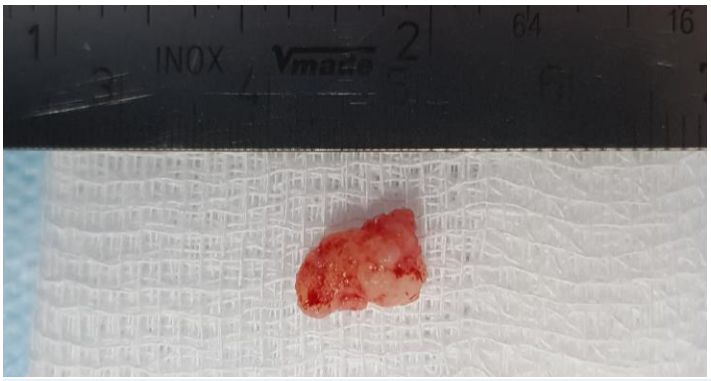
No tumor infiltration of bone laminae. Nerve canal covered with bone tissue.

CLINICAL EVIDENCE

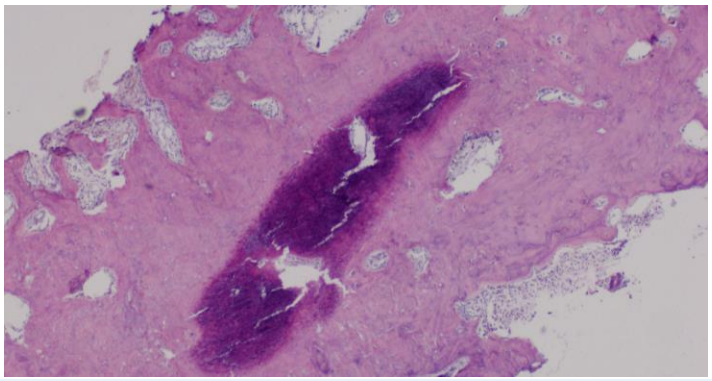
Endodontic treatment ineffective due to canal obliteration



Surgery

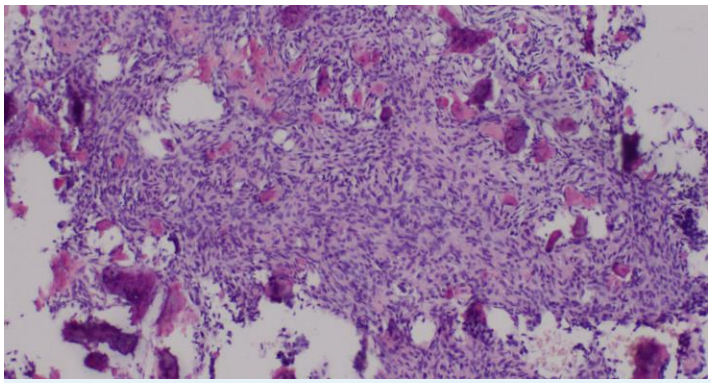


Enucleated mineralized element looks like osteoma

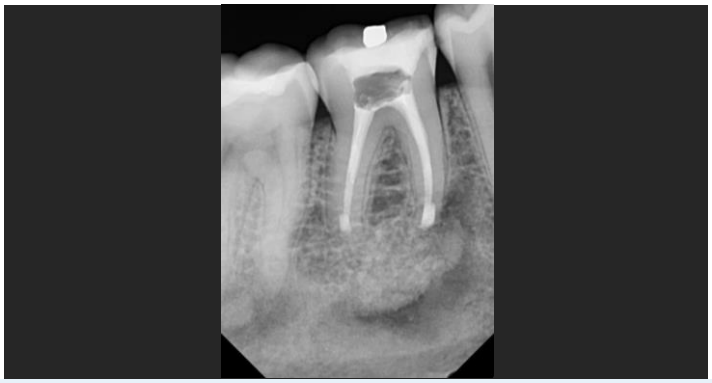


Histological structure of the osteoma (hard part of tumor)

CLINICAL EVIDENCE



Histological structure of the granulation-odontogenic fibroma.



X-ray after surgery

Half-panoramic 3 months after surgery.

Normal healing of the soft tissue after 3 months.

CLINICAL EVIDENCE

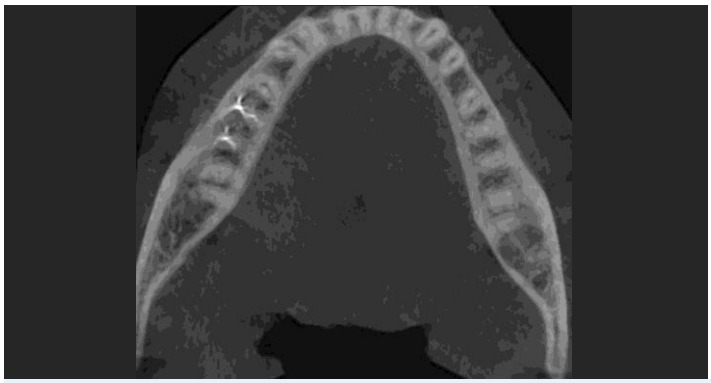
Control X-ray 6-months post-op

Panoramic 6-months post-op

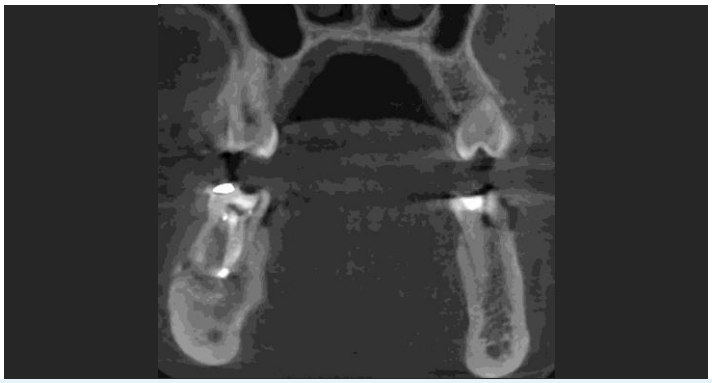
CBCT 6-months post-op

CBCT 6-months post-op

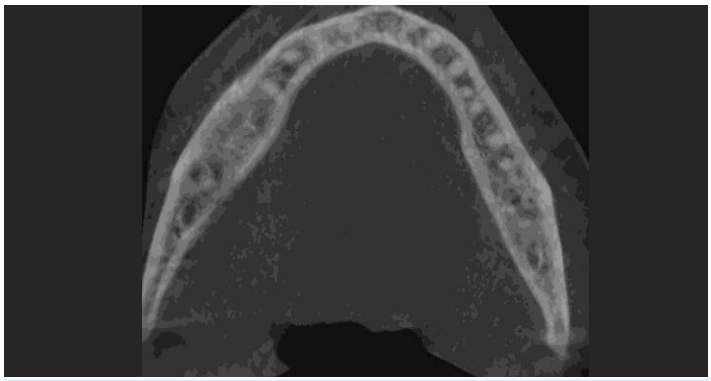
CLINICAL EVIDENCE



CBCT 6-months post-op



CBCT 6-months post-op



. CBCT 6-months post-op

2-year follow up

CLINICAL EVIDENCE

3-year follow up

4-year follow up

4-year follow up

CLINICAL EVIDENCE

6-year follow-up

6-year follow-up

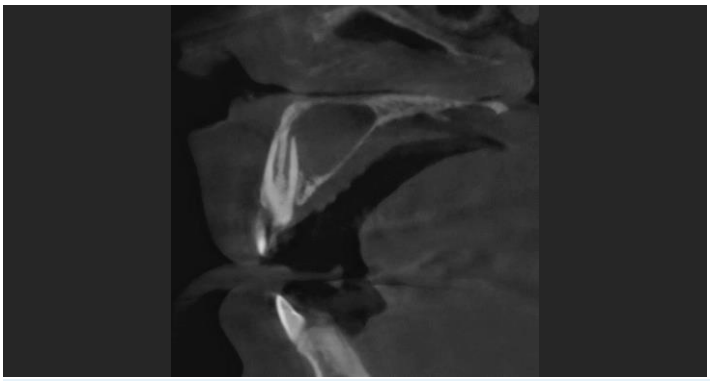
Invaginated Tooth #12 (7)

- The surgical treatment of a dentigerous cyst of the maxilla and the use of biphasic calcium sulfate (Bond Apatite®) in bone augmentation.
- The material was used during the treatment of odontogenic cyst, arising as a result of necrotic changes within the structure of an invaginated tooth #12 (7).
- The cyst of the right maxilla enucleated “en bloc” with simultaneous endodontic treatment of tooth #12 (7) and apical root resection with backfill of the root canal with MTA and augmentation of the bone defect with Bond Apatite® (4 cc).
- In the 4 years of follow-up the very good results of radiological and clinical status were observed without any secondary inflammation.

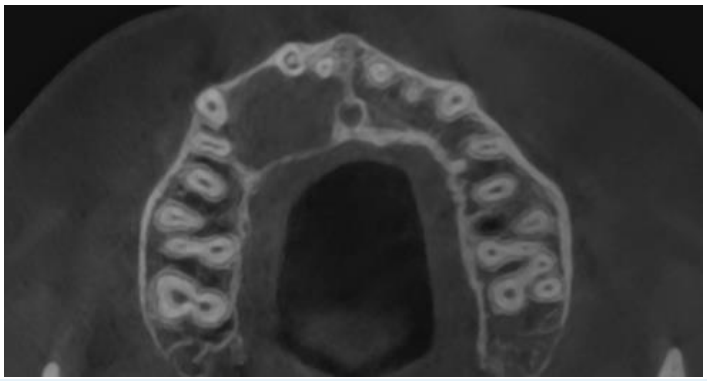
CLINICAL EVIDENCE

Crown shape of invaginated tooth #12 (7)

Cyst as a complication after necrosis of the pulp #12 (7)

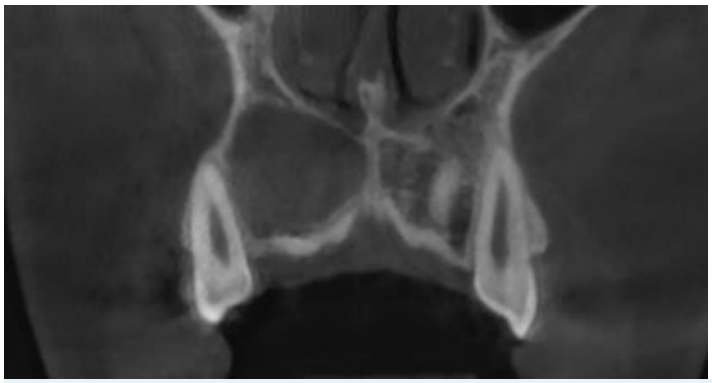


CBCT showing the range of the lesion

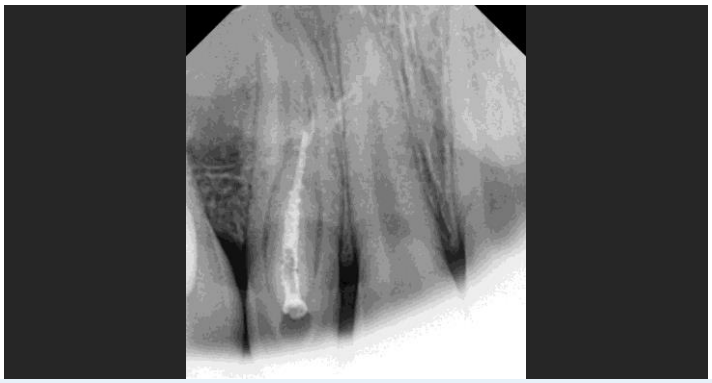


Horizontal CBCT scan

CLINICAL EVIDENCE

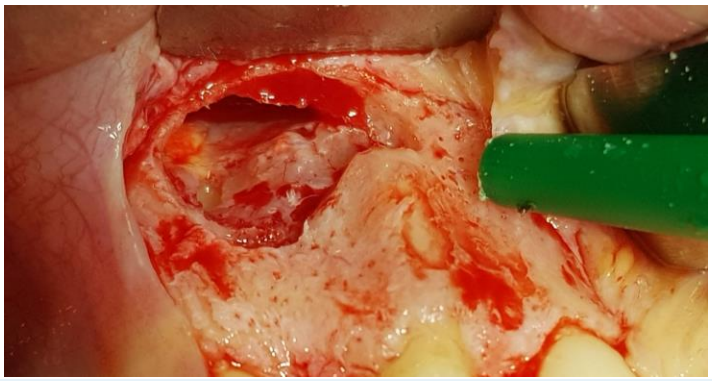


CBCT scan



Endodontic treatment was very difficult and has been done only in half of the canal.

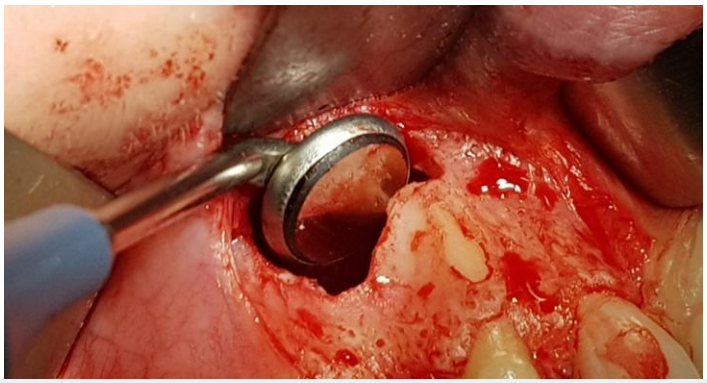
One step surgery treatment. Preparing the flap



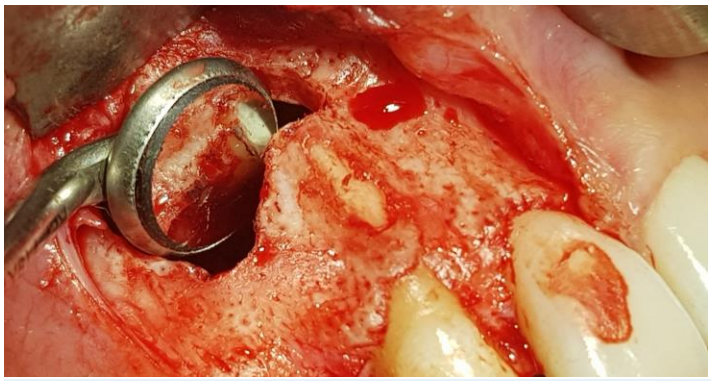
After trepanation of cortical lamina, the cyst is visible.

CLINICAL EVIDENCE

Bone defect after cyst removal



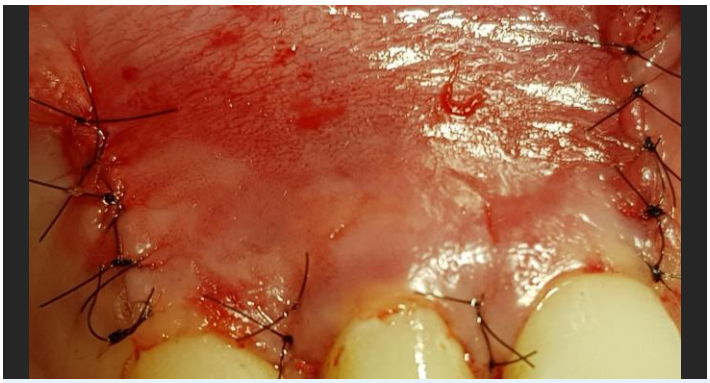
Preparing the root canal



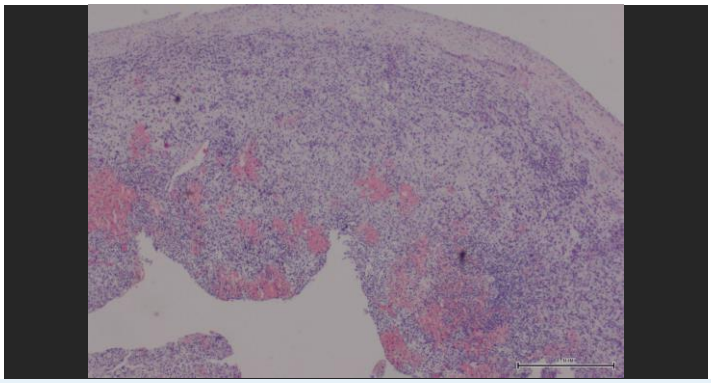
Backfill of the root canal with MTA

Bond Apatite® inside the defect (4 cc)

CLINICAL EVIDENCE



Sutures



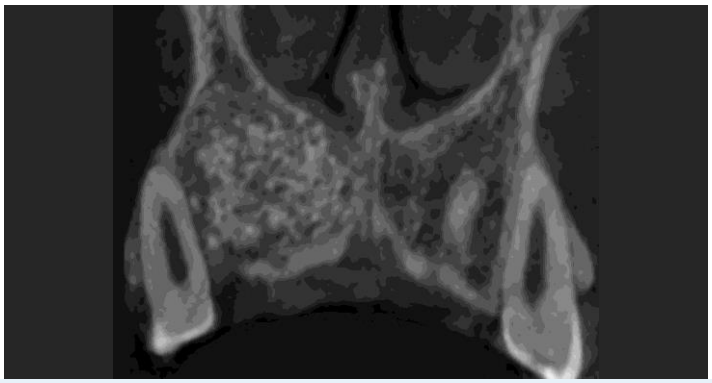
Histopathological study showing typical structure of an inflammatory cyst. Focus 40x, H&E steaming

Control X-ray 7-days post-op

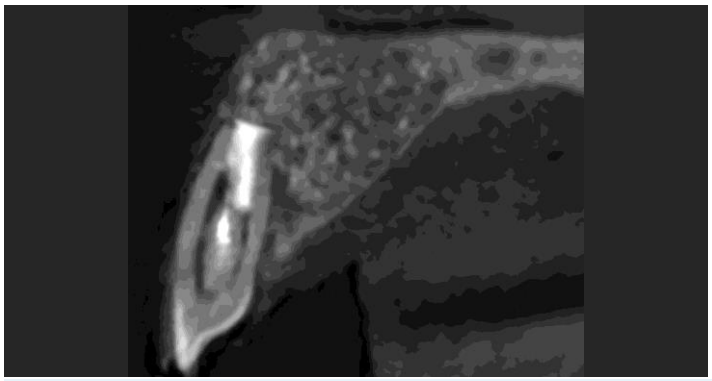
3D CBCT – 7-days post-op

CLINICAL EVIDENCE

Mucosa 7-days post-op



CBCT 3-months post-op



CBCT 3-months post-op

Mucosa 4-years post-op

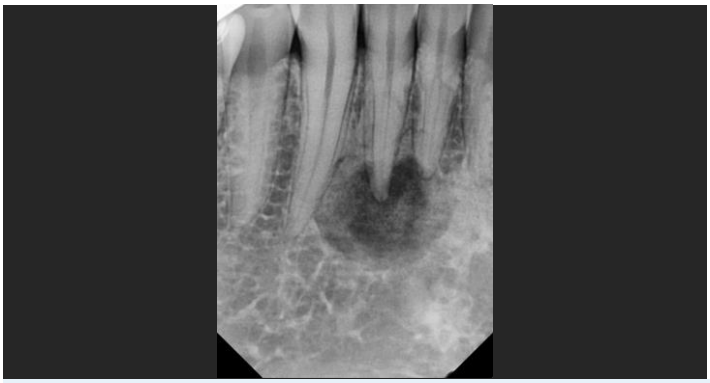
Panoramic 4-years post-op

LEVEL III, CASE #4 | CASE DESCRIPTION

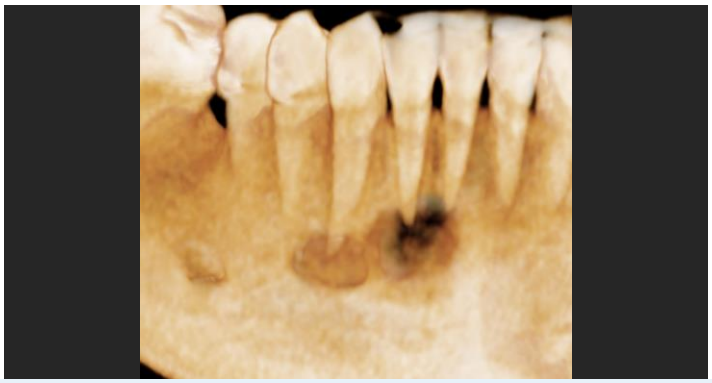
Osteoid Osteoma in the Front of the Mandible

- The patient is a 33-year-old female.
- The first symptom was pain on the right side of the mandible, in teeth #41 (25), #42 (26) and #43 (27) similar to pulpitis.
- After endodontic treatment, the X-ray and CBCT showed a focus of necrosis with strongly shaded elements in the central area.
- Root resection of #42 (26) and #43 (27) resection with backfill of the root canal with MTA.
- The tumor was removed with peripheral bone curettage to about 1 millimeter deep. The biological structure of the tumor was similar to spongy bone but a little harder. The bone defect was filled with Bond Apatite® (2cc).
- The tumor was taken to histopathology with a diagnosis of osteoid osteoma of the mandible.
- Good healing of the wound was observed. The sutures were removed 7-days post-op.
- 12-months post-op no recurrence or secondary inflammatory symptoms were observed.

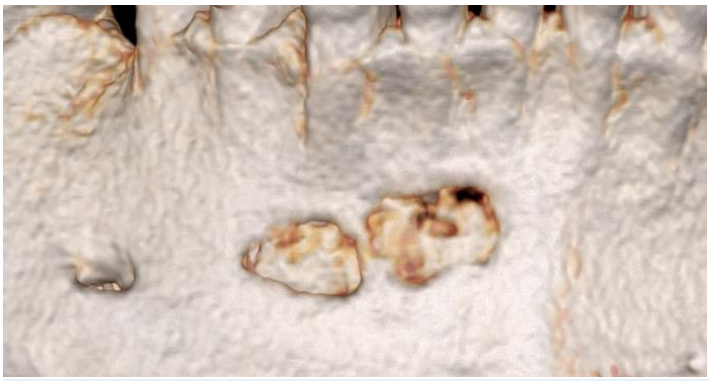
CLINICAL EVIDENCE



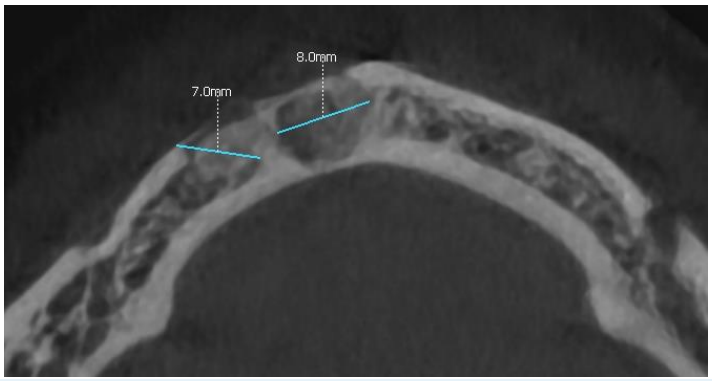
Necrosis in the area of #41 (25) - #43 (27)



CBCT 3D scan



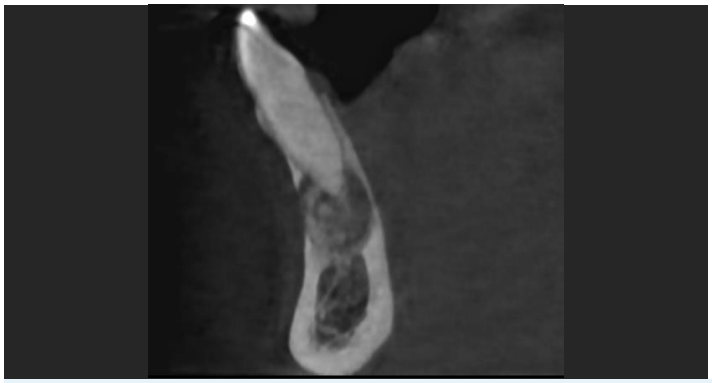
CBCT partial damage of the cortical lamina in the area of #41 (25) - #43 (27)



Horizontal CBCT

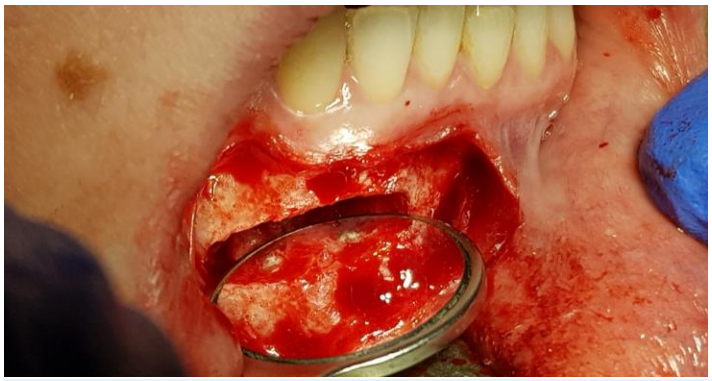
Strongly shaded elements surrounded by inflammatory lesions.

CLINICAL EVIDENCE



CBCT

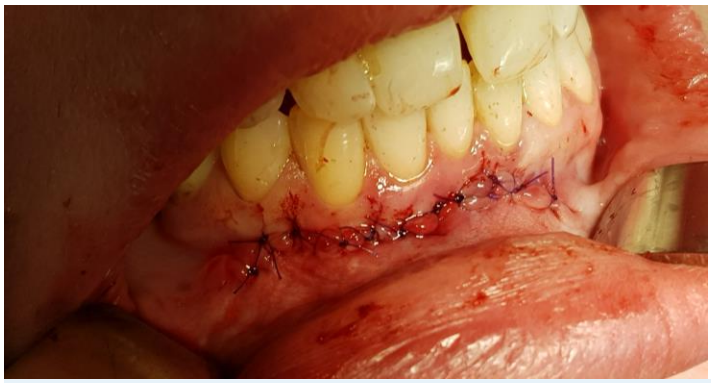
Bone defect after removal of the tumor and apicoectomy #42 (26) & #43 (27).



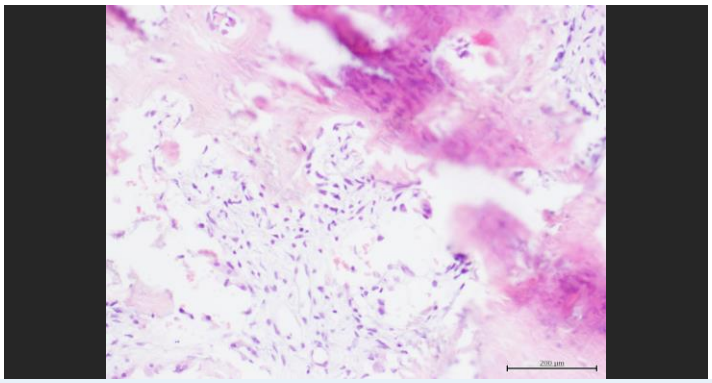
Backfill of the root #42 (26) & #43 (27)

Bond Apatite® in the defect

CLINICAL EVIDENCE



Sutures



Histology of the tumor

Visible parts of the normal and necrotic bone surrounded by inflammatory cells in connective tissue.

7-days post-op

7-days post-op

CLINICAL EVIDENCE

Mucosa 7-days post-op

Mucosa 12-months post-op

12-months post-op

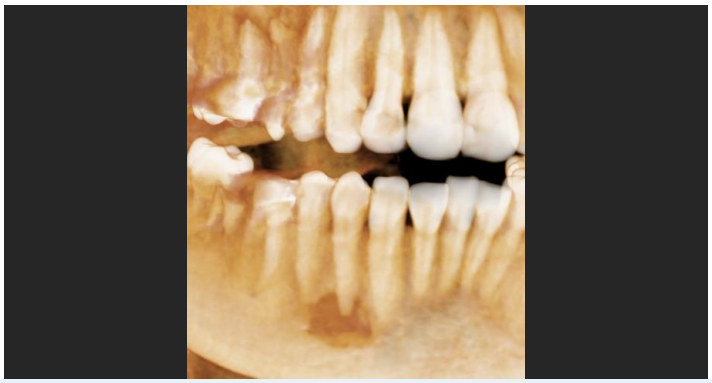
LEVEL III, CASE #5 | CASE DESCRIPTION

Osteoid Osteoma of the Mandible, Lateral Right Side

- The patient is a 35-year-old female.
- The first symptom was numbness of the skin of the lower lip (Vincent syndrome, in the right side of the lateral mandible.
- Neurological damage was excluded.
- Pathological changes in the area were discovered in the roots of #16 (3), #15 (4) and #24 (12).
- CBCT scans found necrotic bone in the area of root #44 (28), which was visible with partial damage of cortical lamina.
- Revision was done with microsurgery techniques.
- Endodontic treatment was performed.
- The tumor was removed. The structure was similar to spongy bone but much softer, with mechanical peripheral bone curettage around the defect up to 1mm.
- The root of #44 (28) was resected 3mm, with backfill of the canal with MTA.
- The bone defect was filled with Bond Apatite® (1cc).
- The tumor was taken to histopathology, for a diagnosis of osteoid osteoma of the mandible.
- Good healing of the wound was observed, and the sutures were removed 7-days post-op.
- Six months post-op, no recurrence of tumor growth or inflammation were observed. During this period the cortical lamina completely regenerated, and Vincent symptom was gone.
- Throughout the next two years, we observed good remodelling of the bone and soft tissue.

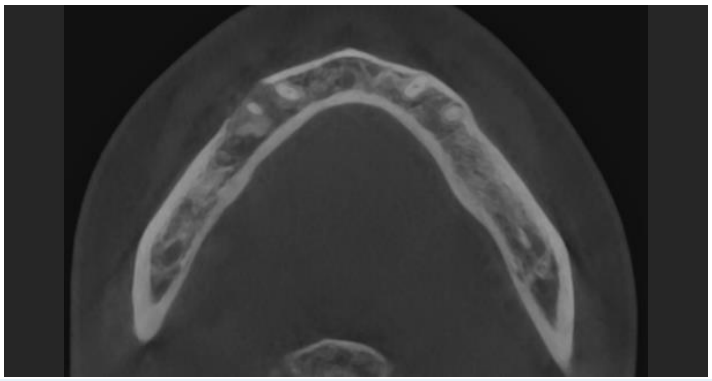
CLINICAL EVIDENCE

The tumor is not visible on the panoramic, but the patient experiences numbness of the lip on the right side.



3D CBCT scan showed necrosis of the bone around root #44 (28).

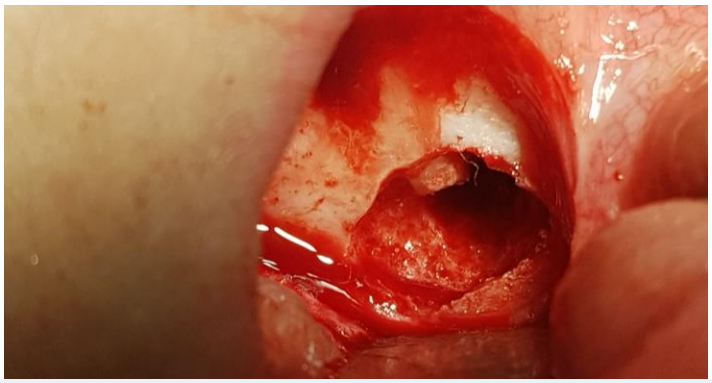
CBCT strongly shaded parts around root #44 (28) with damage of cortical lamina.



The tumor is also visible in a horizontal scan.

CLINICAL EVIDENCE

After flap opening and preparation of the cortical lamina the structure of the tumor is visible.



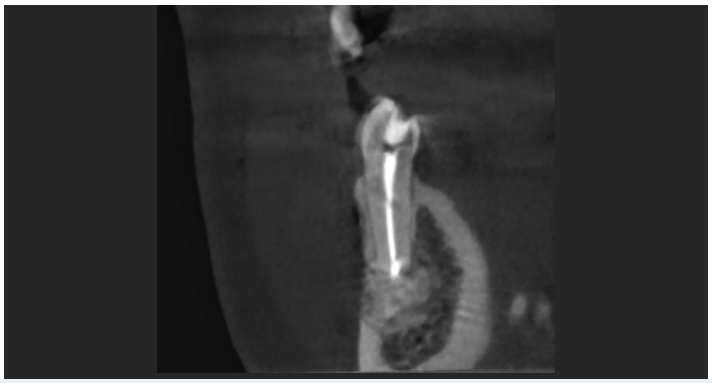
Tumor removal, apicoectomy of #44 (28) with backfill of MTA and peripheral bone curettage around the defect up to 1 mm.

Bond Apatite® (1cc) inside the bone defect.

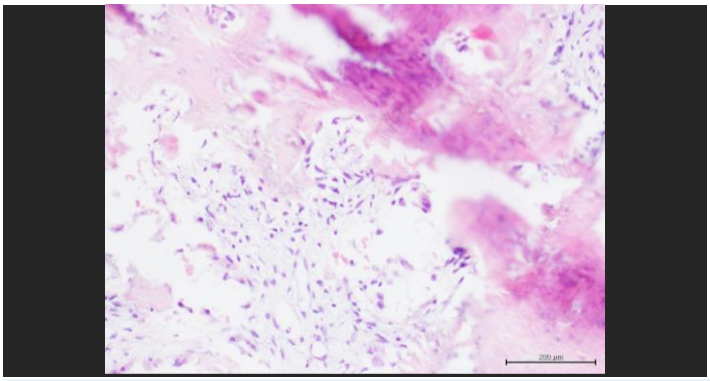
7-days post-op

CLINICAL EVIDENCE

CBCT scan 7-days post-op



7-days post-op shows good holding of material inside the defect.



Histology showing necrotic parts of bone with normal bone surrounded by many inflammatory cells in connective tissue.

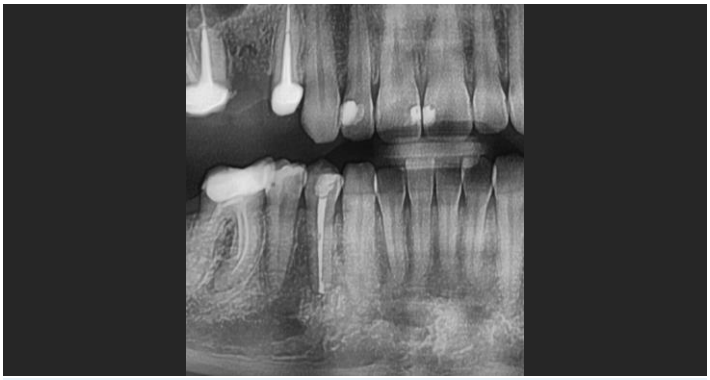
Focus 100x, H & E steaming

3-months post-op

CLINICAL EVIDENCE

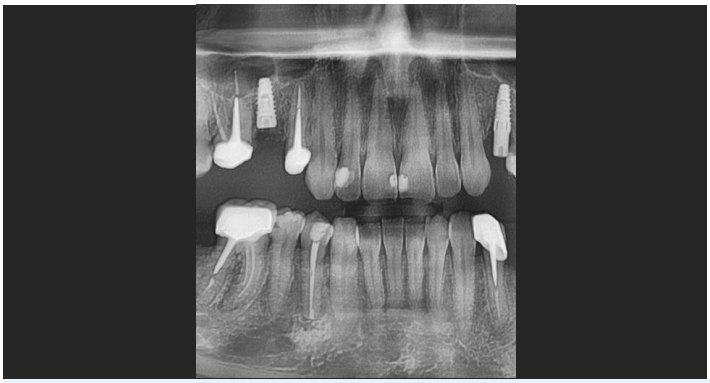
Musoca 3-months post-op

CBCT 6-months post-op showing the completely regeneration of cortical lamina.



1-year post-op

CLINICAL EVIDENCE



2-years post-op

2-years post-op

3-years post-op

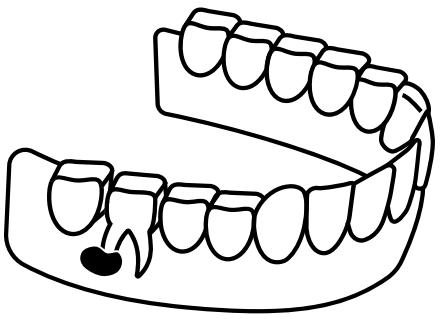
Learn More

The Use of Bone Cement in The Support of Surgical Treatment of Odontogenic Cysts

- The lecture presents dozens of cases of surgical treatment of small and large odontogenic cysts and similar pathologies of the jaws. In the surgical treatment, endodontic microsurgery techniques were used as well as augmentation of bone defects with the use of Bond Apatite®. In the 6-8 months of clinical follow-up and radiological observation, normal remodeling and formation of new bone tissue as well as stability of resected teeth and soft tissues were noted. Each cyst and tumor was histopathologically examined.

ON-DEMAND WEBINAR

CLINICAL CASES



Meet the Expert

Damian Dudek, DMD, PhD

Dr. Dudek is a native of Czestochowa, Poland. Now lives with his family in Torun, Poland. He came to Zabrze to attend Silesian Medical University, and he was admitted to the Dental School of Medicine, where he graduated near the top of his class. Then he was admitted to the Oral and Maxillofacial department in St. Barbara`s hospital (Regional Traumatology Centre). During his work, he completed over 3000 oral surgery and implantology procedures. While there, he also did original research in the area of oral surgery and cardiology, and he defended his doctoral thesis: Platelet function in patients treated with acetylsalicylic acid in the aspect of dental surgical procedures. Dr. Dudek continues this research panel to the present, with publication in the country and international journals. He is also a diplomate oral surgeon (passed specialization state examination). He is scientifically connected as a volunteer with the Department of Histology and cell pathology in Silesian Medical University. He continues research in the area of dental surgery, implantology, with particular emphasis on the odontogenic cysts and tumors of the jawbone in the surgical and histological aspects.

Dr. Damian Dudek Bone Cement Expert Page

References

1. Kaczmarzyk T, Stypułkowska J, Tomaszewska R. Torbiele Obszaru Szczękowotwarzowego. Kwintesencja. Warszawa. 2009.
2. Morgan PR. Cysts and cystic lesions of the jaws. Current Diagn Pathol 1995; 2: 86-93.
3. Tsuneki M et al. Combined immunohistochemistry for the differential diagnosis of cystic jaw lesions: its practical use in surgical practice. Histopathology 2010; 57: 806-813.
4. Brenda L. Nelson, Billy J. Phillips. Benign Fibro-Ossoeus Lesions of Head and Neck. Head Neck Pathol 2019; 3: 466-475.
5. Bertolini F et al. Multiple ossifying fibromas of the jaws: a case report. J Oral Maxillofac Surg 2002; 60: 225-229.
6. Y Liu, H Wang, M You, Z Yang, J Miao, K Shimizutani, T Koseki. Ossifying Fibromas of the jaw bone: 20 cases. Dentomaxillofac Radiol 2010; 1: 57-63.
7. Pick E, Schäfer T, Al-Haj Husain A, Rupp NJ, Hingsammer L, Valdec S. Clinical, Radiological and Pathological Diagnosis of Fibro-Osseus Lesions of the Oral and Maxillofacial Region: A Retrospective Study. Diagnostics (Basel) 2022 Feb; 12(2): 238. Published online 2022 Jan 19. doi: 10.3390/diagnostics12020238.
8. Yahav A, Kurtzman GM, Katzap M, Dudek D, Baranes D. Bone Regeneration. Properties and Clinical Applications of Biphasic Calcium Sulfate. Dent Clin N Am 2020; 64: 453-472.
9. Baranes D, Kurtzman GM. Biphasic Calcium Sulfate as an alternative grafting material in various dental applications. J Oral Implantol 2019 May 1. doi: 10.1563/aaid-joi-D-18-00306.[Epub ahead of print].
10. Dudek D, Reichman-Warmusz E, Kurtzman GM, Mahesh L. The use of grafting material biphasic calcium sulfate for the treatment of osseous defects resulting from radicular cysts. Clinical study and six-month follow up. J Osteointegr 2020; 3: 1-6.

AUGMA INTERNATIONAL

Educational Platform for Bone Graft Cement Users

Telegram

- Clinical cases from Bone Cement Experts
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