Submitted in total fulfilment of the requirements for the

Romanian Dental Awards – 4th Ed. 2025

(F.D.I. tooth notation has been used in all the following case reports)

Patient details:

Name: NT
Sex: F
Age: 31
Occupation: accountant

a) **Reason for appointment**

Patient was seen on 12/10/22 when she requested an appointment to assess tooth no.1.2

b) **History**

Tooth 1.2 started presenting a blister in the fixed gum related to the tooth, for the last 12 months. No pain or history of swelling was reported. Patient doesn't remember anything about any treatment done on the tooth. The patient was having braces.

Diagnostic photographs 22.11.2022

Diagnostic x-ray 12.10.22

Quality: A

Type of x-ray: PA

Justification: pretreatment assessment

Bone levels: 2mm bone loss M/D

Obs: open apex

No restoration

No widened PDL

No previous RCT

No fractures

Presence of fixed braces

Suspicion of invagination class I

Apical radiolucency: Y- 8/5mm

2. **Relevant Dental History**

The patient is a regular attender of our practice. The patient had braces at the moment of her first appointment(12.10.22) which were removed by the orthodontist to facilitate the rubber dam isolation, and fixed retainer was fitted to preserve the teeth alignment(22.11.22). She couldn't remember any episode of trauma.

3. **Relevant Medical History**

There was no relevant medical history.

c) **<u>Examination</u>**

Extraoral

There were no significant extra oral findings.

Intraoral

Soft tissues:

There were no significant intra oral findings.

Periodontal tissues: there were no periodontal pockets, no tartar deposits

C.P.I.T.N.

0	0	0
0	1	0

Teeth present:

7654321	1234567
7654321	1234567

Teeth: sporadic fillings in both arches, overall good OH

Specific examination of the lower left area:

1.2: no restoration present, no mobility recorded, no tenderness to pressure, probing within normal limits, non-responsiveness, no swelling, sinus tract in the fixed gum related to the tooth.

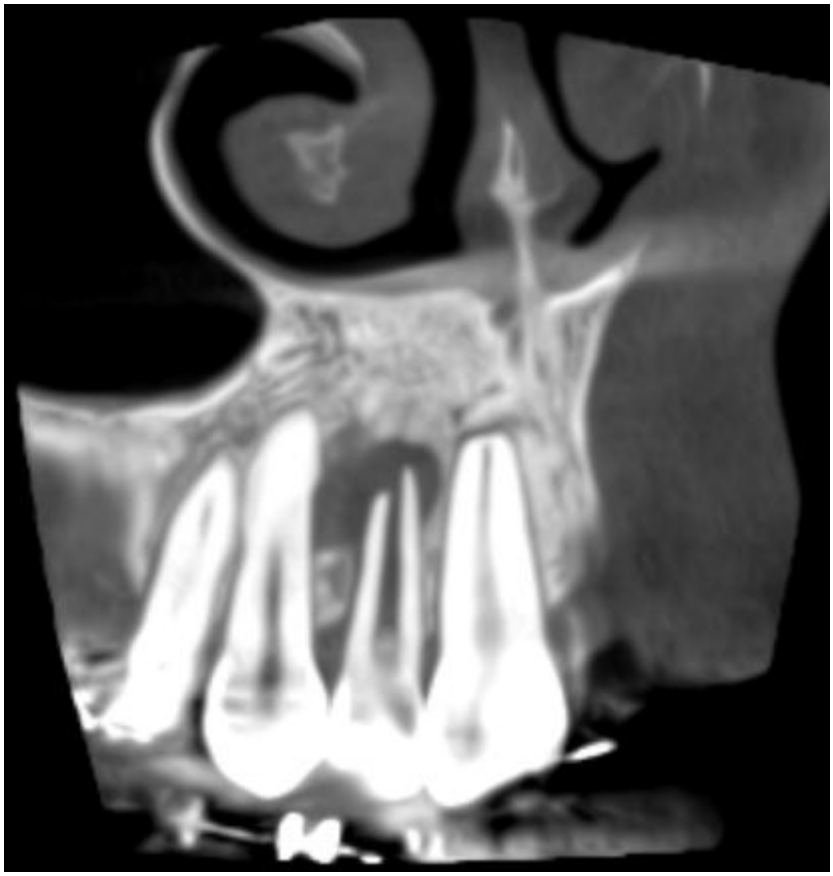
d) **Special tests**

Radiographic examination

Radiographic examination showed radiolucency in association with the apices of the tooth, no root filling in the canal, no history of trauma, immature root with open apex, mesenchymal invagination in the coronal aspect of the tooth.

CBCT examination

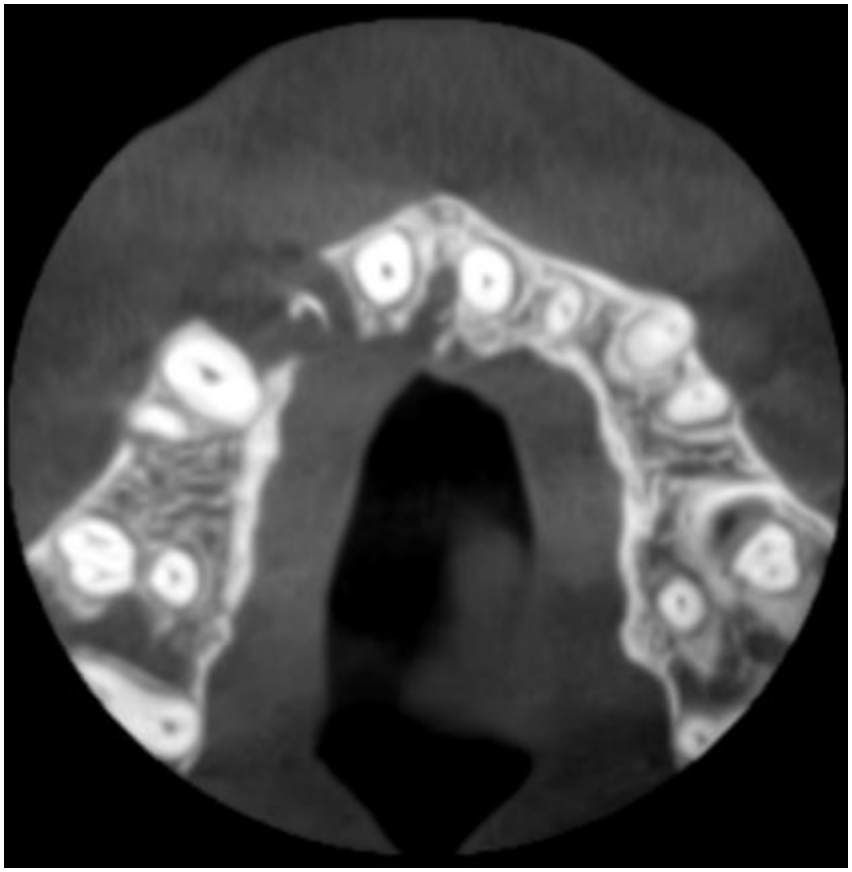
Due to the anatomic complexities, a CBCT was decided as necessary to assess the best endodontic access along with the anatomy that raised concerns related to the process of debridement.

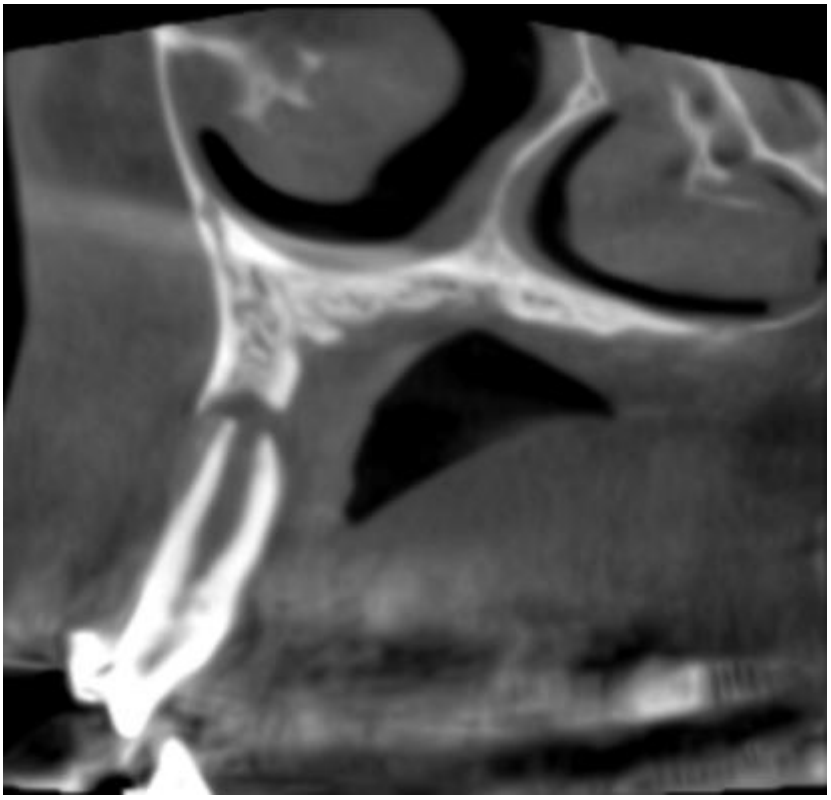


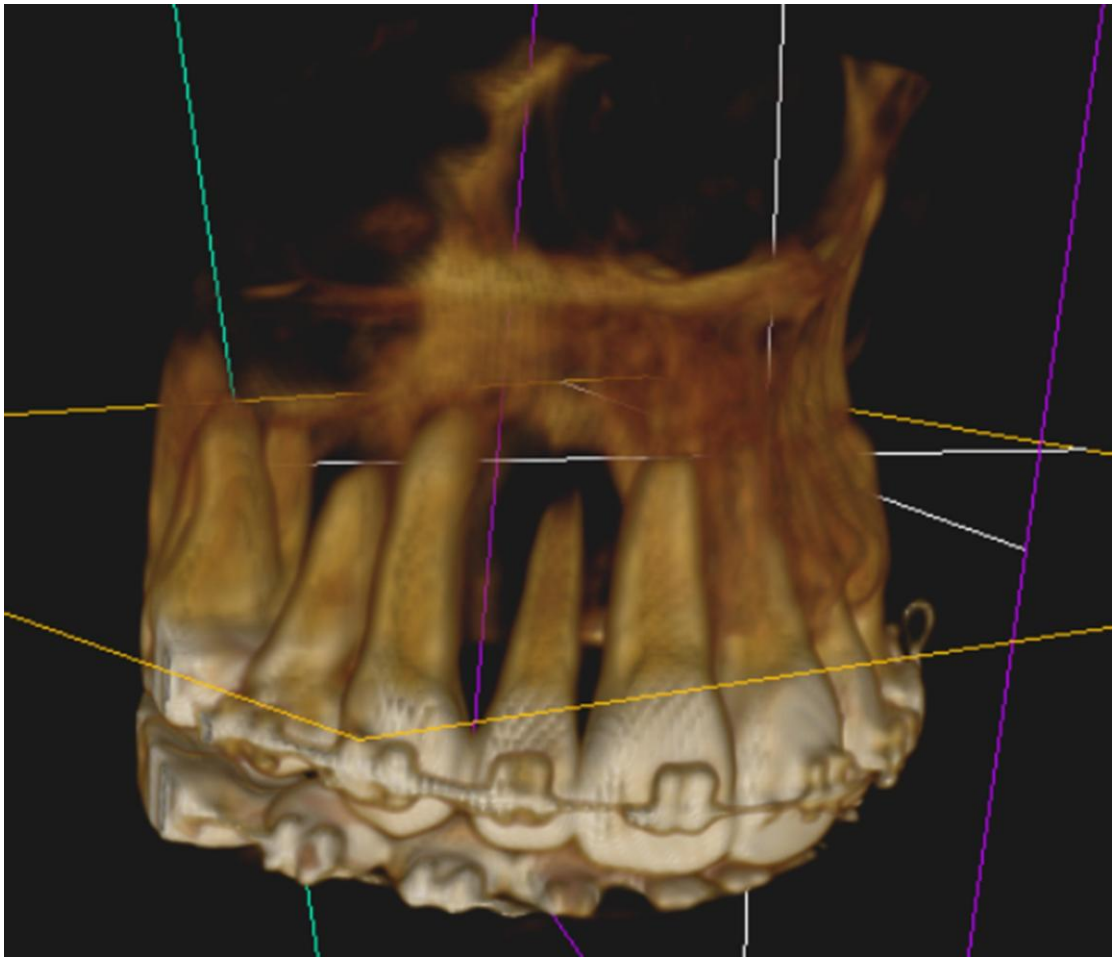
CBCT reporting

- The scan covers the area of: upper jaw
- Scan of: maxilla
- Area of interest: tooth 1.2
- No of canals:1
- Canal anatomy: open apex, reversed taper, dens invaginatus Oehler Type I
- Presence of RCT : N

- Coronal restoration: N
- Pathology of the bone: N
- Pathology of the sinus: N
- Apical pathology: Y- 7.5/5/7mm
- Bone loss/ bone levels- normal
- Quality of the image -A
- Justification: suspected anatomic complexity
  perforation of the B& P plate







e) **Diagnosis**

1.2: dens-in-dente with necrosis and apical periodontitis, associated with root resorption and open apex.

f) **Treatment options**

The treatment options were discussed with the patient and these included:

1. Do nothing and monitor, which was unacceptable for the patient
2. Root canal treatment
3. Extraction of 1.2 and replacement either with bridge, implant or denture.

g) **Treatment plan**

After discussion with the patient regarding the advantages and disadvantages of the above options, it was decided root canal treatment to be carried out on 1.2.

h) **Description of treatment**

12.10.2022 First visit: assessment+x-rays,

22.11.2022 Second visit: photos+treatment

Under rubber dam isolation and microscope magnification, the tooth was accessed. The large canal was inspected, scouted and measured. The canal proved to be larger than the size 90 k-file, hence the debridement was carried out with versa brushes powered by the slow handpiece, using brushing movement till the canal looked clean. Irrigation with 17% EDTA (ethylene-diamine-tetra-acetic acid) (Pulpdent®) and

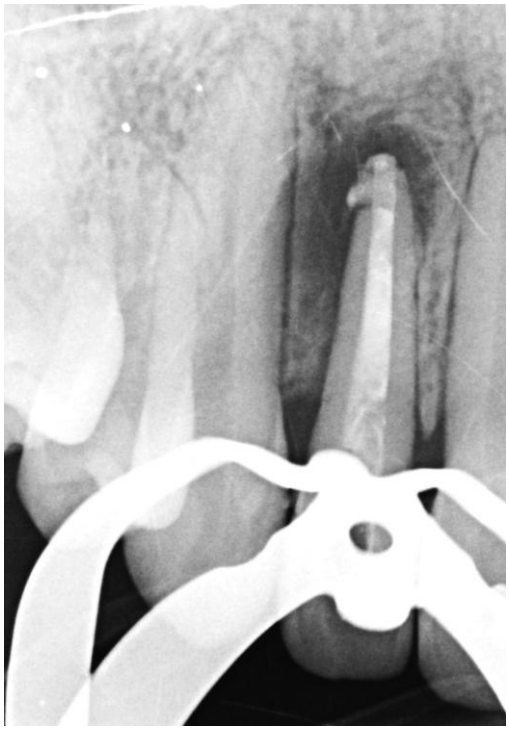
5,25% NaOCl (sodium hypocloride) (Cerkamed®) was carried out under sonic agitation, with saline flush between the two. A “zero” apex locator (NSK iPex II®) reading was obtained. Working length was deemed to be same as the diagnostic length, 20mm. The canal was dried using paper points inserted reversely into the canal. CaOH dressing was left in the canal for 4 weeks on one hand to stop the external root resorption, on the other hand, to prime the dentine for the future MTA plug.

21.12.2022 Third visit: The tooth was isolated and accessed. The CaOH dressing was flushed out with EDTA 17%. Versa brushes were used to reclean the root canal for 1 minute. Saline flush was used to remove the EDTA and NaOCl 5,25% was used along with the Versa brushes, to remove any possible leftover of debris. A piece of collagen was placed apically to prevent the overextension of the MTA apical plug which was placed using am MTA carrier, till an apical plug of at least 5mm was achieved. Since pressure on the lateral walls was to be avoided, full MTA root filling was opted for, rather than flowable GP under warm vertical compaction. On top of the MTA, once it set, a light cure GIC(Riva®, SDI) filling was placed. On top of this, composite SDR was placed, using incremental technique.

Post operative radiograph was taken and looks satisfactory.

Post-op radiographs on the day and 35 months later

21.12.2022 **11.11.2025**



On the 35 months post-op radiography, a nearly complete resolution of the periapical radiolucency is noticeable, along with a well-adapted MTA root filling. The patient

mentioned that the sinus tract kept draining serous discharge several months after the root canal treatment was completed.

i) **Discussion**

A thorough chemical cleaning is the key for success in immature teeth with wide opened apices. In this case no instrumentation being carried out, the role of the files being taken over by these marvellous brushes, making the cleaning and debridement not only safe but thorough. It can only be assumed that the necrosis and the large lesion was caused by the invagination of the mesenchymal plate during the genesis of the tooth, although not all the teeth presenting such an anomaly, turn necrotic. Such a pathology with the associated anatomy (halted root development) cannot be caused by a trauma or an orthodontic appliance.

Although a root filling shouldn't be completed as long as a fistula is still present in the gum, most of the time this fistula closes in time, once the body's immune and lymphatic system manages to contain and neutralize the endotoxins and their effect in the periodontal tissues.

Although the 35 months recall x-ray shows little to no radiolucency, proving the correctness of the treatment protocol, on long term the prognosis is guarded due to the fragility of the root(tooth). In case of a tooth presenting this anomaly(dens in dente), the only reliable treatment is to destroy the anomaly(invagination), whereas preserving it, will only leave an open portal for the bacteria to infiltrate the endodontic space.