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: PC
Sex: F
Age: 78
Occupation: pensioner

a) **Reason for appointment**

Patient was seen on 24/01/22 when she requested an appointment due to pain in UL2.

b) **History**

Tooth 2.1 started aching some months ago, pain comes and goes, dull ache of an intensity of 6/10, along with tenderness to pressure. No swelling or fistula were observed or reported. Patient doesn't remember anything about any treatment done on the teeth.

**Diagnostic radiograph 24.01.2022**

Type of x-ray: PA

Justification: pretreatment assessment

Bone levels: 3mm bone loss M/D to 2.1 & 2.2

Obs: open apex

M white filling in 2.2

No widened PDL

No previous RCT

No fractures

Apical radiolucency: Y in 2.1 and 2.2- of 3/3mm

Quality: B

2. **Relevant Dental History**

The patient is a regular attender of our practice. She couldn't remember any episode of trauma.

3. **Relevant Medical History**

The patient was on anti-cholesterol and high blood pressure medication.

c) **Examination**

## 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.**

| | | |
|---|---|---|
| 3 | 1 | 1 |
| 2 | 2 | 3 |

Teeth present:

| | |
|---|---|
| 7 54321 | 12345 78 |
| 7 54321 | 123456 |

Teeth: sporadic fillings in both arches, fair OH

**Specific examination of the lower left area**:

**2.1:** no restoration present, no mobility recorded, no tenderness to pressure, probing at cut-off level, non-responsiveness, no swelling, no sinus tract, bleeding on probing,

**2.2:** M white restoration present, no mobility recorded, tenderness to pressure, probing at cut-off level, non-responsiveness, no swelling, no sinus tract, bleeding on probing.

d) **Special tests**

## Radiographic examination

Radiographic examination showed radiolucency in association with the apices of the teeth, no root filling in the canals, the patient can't recall any history of trauma,

## CBCT examination

Due to the anatomic complexities, a CBCT was decided as necessary to assess if there is an accessible canal in both teeth and which is the best endodontic access.

**CBCT reporting**

- The scan covers the area of: upper front jaw
- Scan of: 1.3-2.3
- Area of interest: teeth 2.1, 2.2
- No of canals:1/each
- Canal anatomy: severe calcification in 2.2 and moderate calcification in 1.2
- The canal in 2.1 was located 12mm from the incisal edge and 17mm from the incisal edge in 1.2.
- Presence of RCT : N
- Coronal restoration: Y – 1.2
- Pathology of the bone: N
- Pathology of the sinus: N
- Apical pathology: Y- 4/4mm in 1.2
- Bone loss/ bone levels- normal
- Quality of the image -A
- Justification: morphology identification
- perforation of the B& P plate

e) **Diagnosis**

**2.1:** partial canal obliteration

**2.2**: partial canal obliteration, necrosis with apical periodontitis

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 under guided endo protocol
3. Extraction of 2.2 and replacement either with bridge, implant or denture.

g) **Treatment plan**

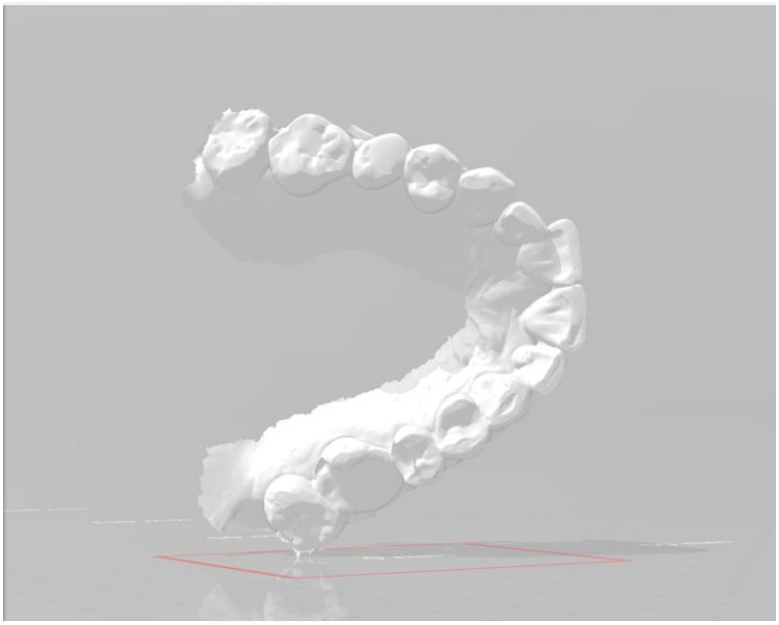
After discussion with the patient regarding the advantages and disadvantages of the above options, it was decided root canal treatment under guided endo to be carried out on both 2.1 and 2.2.

h) **Description of treatment**

**24.1.2022 First visit:** assessment+x-rays,

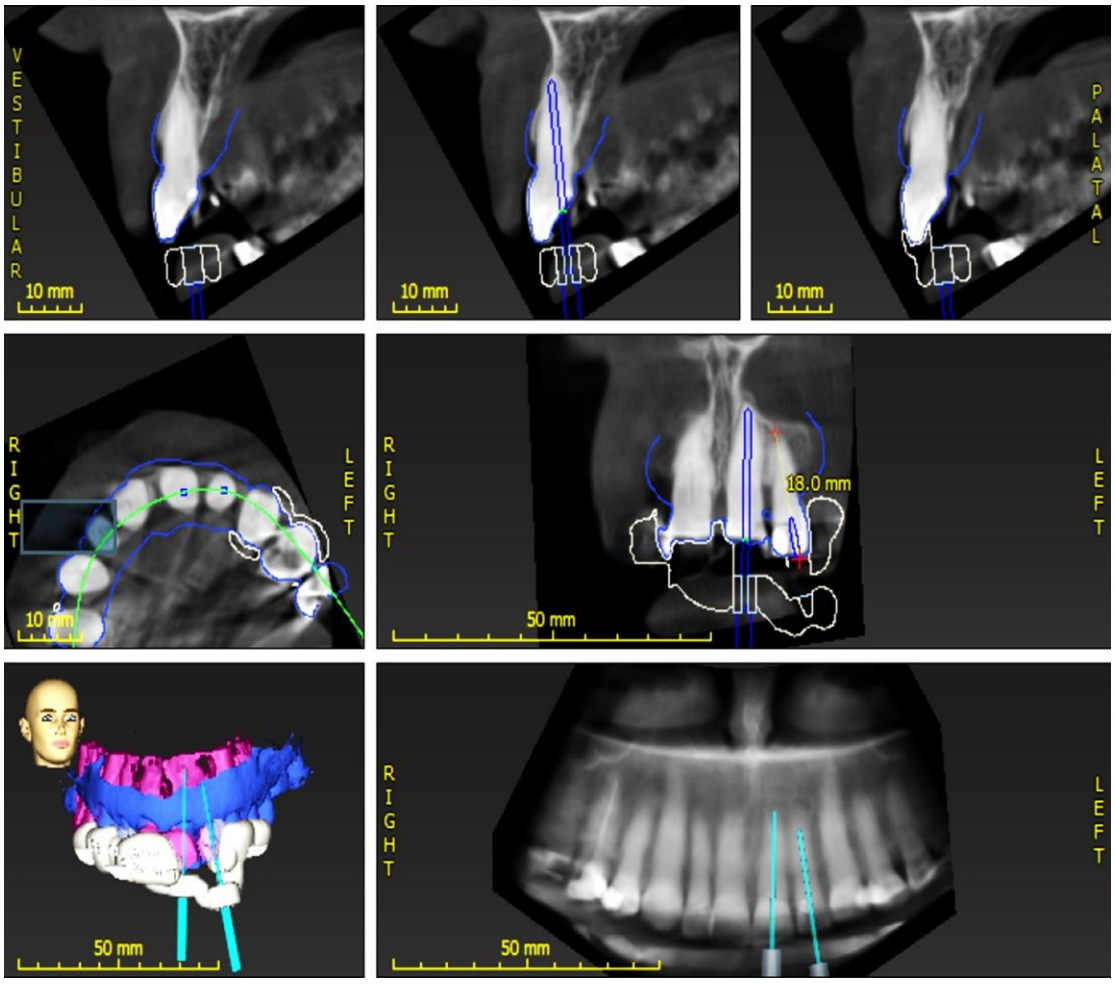
**18.02.2022 Second visit**: oral scan+CBCT scan

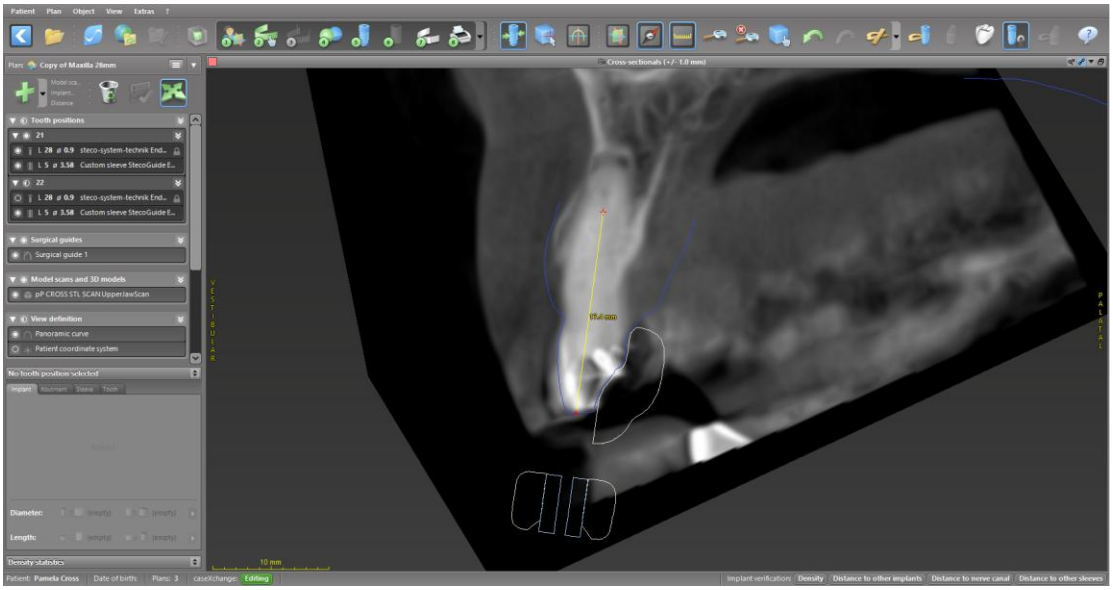
Between the 2nd and the 3rd visit, based on the two scans the stent was planned and manufactured, using the Codiagnostix® software.

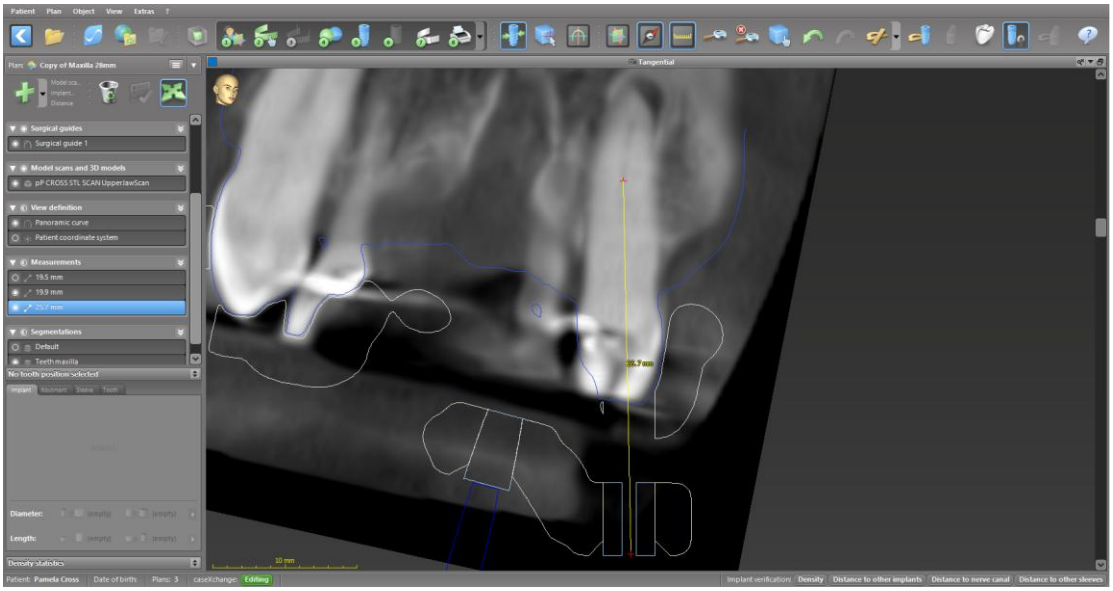


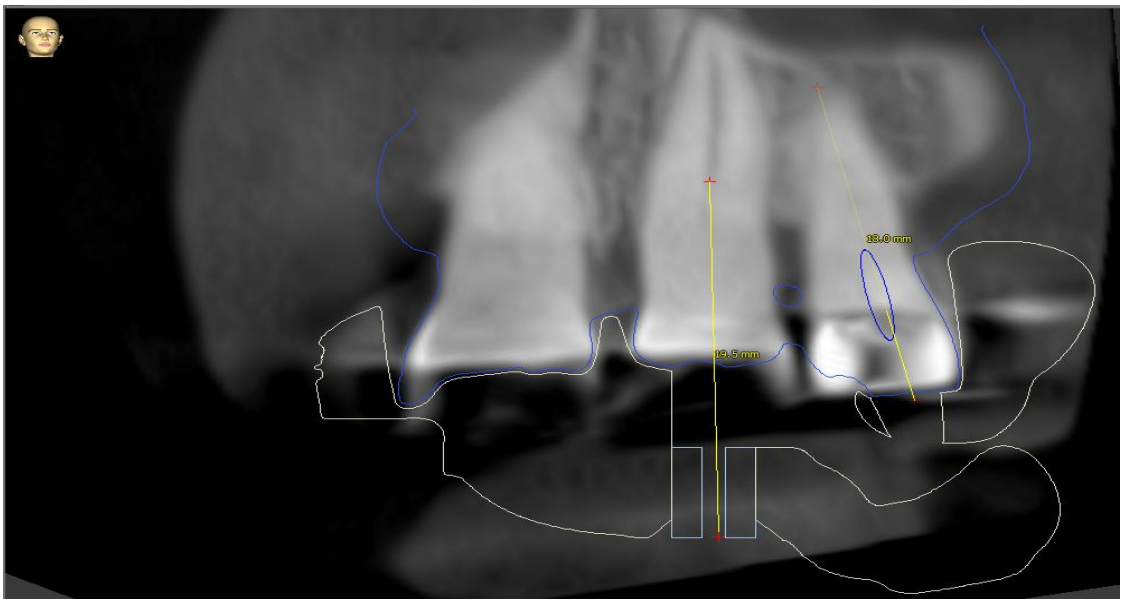
Oral Scan

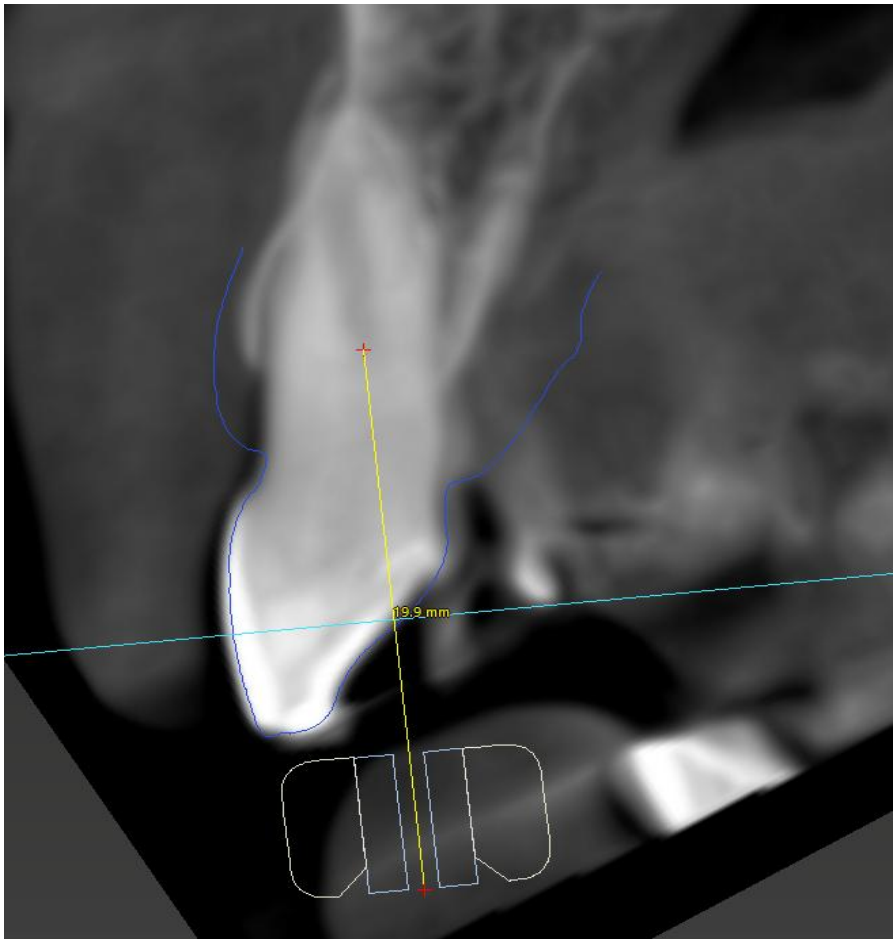
**Treatment planning with Codiagnostix® -** planning the angles and depth of the drilling for both teeth.








18,0 mm
19,5 mm




The 3D printed stent

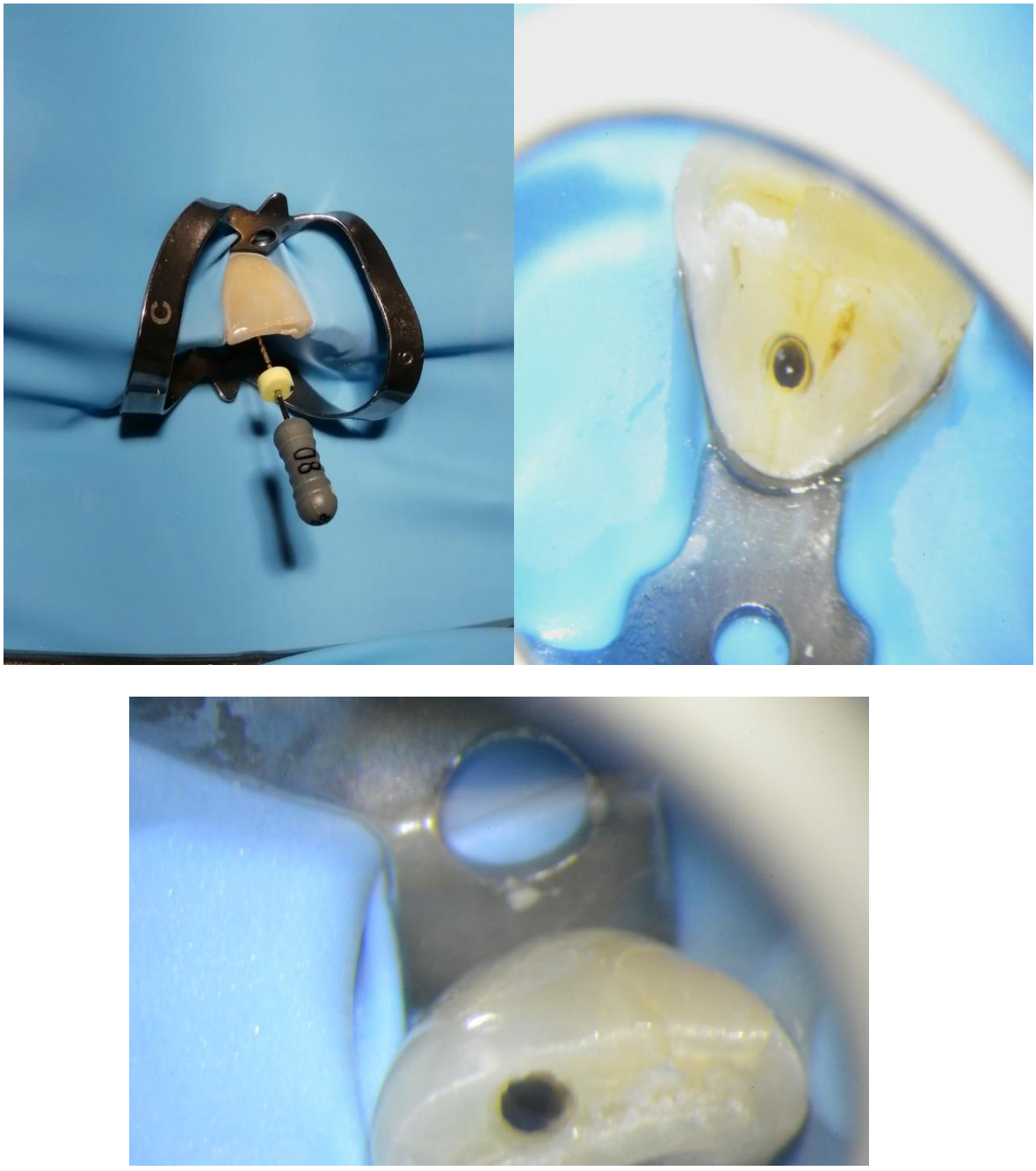
**18.03.2022 Third visit**: guided endodontic treatment

First the stent was applied on the top jaw and firmly held into position while the access point was marked in both teeth, using a mechanical pencil with graphite tips. Then the stens was removed in order to drill the first millimetres in the enamel, using high speed and diamond access bur. Once the drill reached the dentine, the stent was placed back into position under firm pressure, and the special dentine drill (Steko®) was used to drill to the planned level in both teeth. Once this point was reached, a size 08 K-file was used to scout the access cavity.

Marking the access point on the enamel

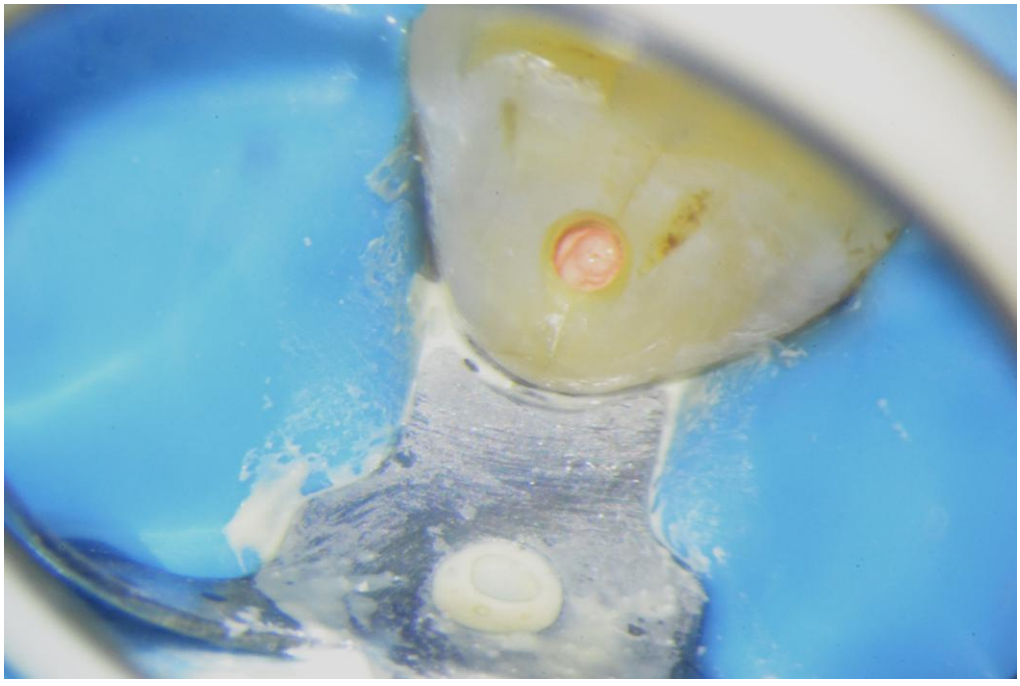
Once the canal was identified in each tooth, under rubber dam isolation and microscope magnification the canals were scouted and measured. EDTA was used for initial irrigation. The canals were gradually enlarged to size 10 ISO, then a glide file was used to create a glidepath (Proglider®). The first shaping file(Protaper S1®) was used to start the engine-driven instrumentation, then the canals were enlarged to F2 in tooth 2.1 and F3 in

2.2, under NaOCl 5.25% irrigation, with a final flush of 17% EDTA. Standardised F2 and F3 tapered gutta percha points (Protaper®) were selected and trimmed apically to achieve “tugback”. The points were placed in the canals and periapical radiograph was taken to check the cone fit. The radiograph confirms working length.



Access cavities of teeth 2.1 and 2.2

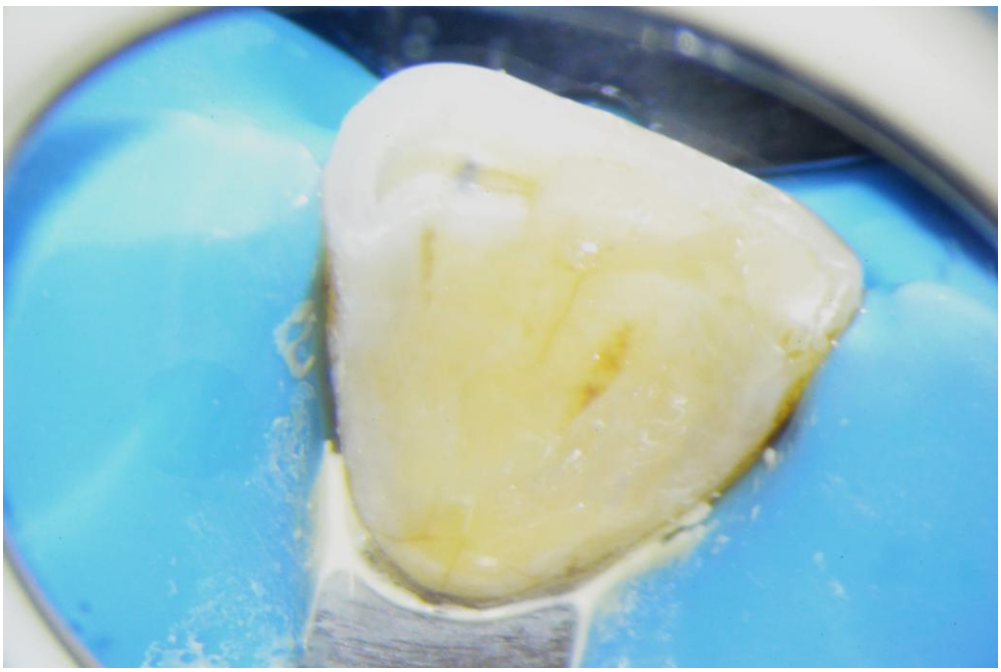
Cone fit of tooth 2.1 and post-op x-rays of teeth 2.1, 2.2



Post- fill image of tooth 2.1

Obturated with warm vertical compaction using the calibrated gutta percha points together with AH Plus® sealer. Post operative radiograph was satisfactory. Restored tooth with composite (Venus®) using the incremental technique. Occlusion checked. Post operative

instructions given, warned patient of flare-up and to have anti-inflammatory drugs taken 2 pills each day for 3 days.



**Post-op image of tooth 2.1**

**25.03.22 Fourth visit**: during which the patient narrated that tooth 2.2 stopped aching for the first time in 6 months.

## Discussion

Digitally guided endodontic treatment is the solution to save teeth presenting heavy calcifications of various origins. The loss of tooth structure is minimal, whereas the precision of the manoeuvre is crucial. Any variation over 1° of the angle of the drill might make the difference between success and failure. The procedure is not user sensitive although there is a learning curve like in any other domain of dentistry. More importantly, the planning of the stent is the one defining phase that bares the responsibility of reaching our anatomic target or not. This case was unique under many aspects, one of them being the treatment of two calcified teeth at the same time, the other being the difference in

difficulties of the two treatments, one of which necessitated to drill 3-4mm close to the foramen in order to find the remaining canal.