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Scientific Editorial: Orthodontic And Prosthodontic Interdisciplinary Approach For A Smile Makeover

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Abstract:

There is currently great demand among adult patients for aesthetic solutions.. Patients walk in specifically for the smile makeovers. This case report shows the step by step of a multidisciplinary treatment plan and the rationale for each part of a process where orthodontics and prosthetics are involved.

Keywords: multidisciplinary approach, smile maker over, Interdisciplinary dental treatment

Case Report:

A 39 year old patient walked with maxillary midline diastema in the maxillary anterior region with 90 degrees rotation of tooth number 7(fig 1 and fig 2). It was also observed that the lower anterior region also had diastemas. The patient's main concern was that he wanted a better smile. After clinical and radiological examination followed by the discussion with the patient , it was decided to go ahead with a multidisciplinary approach. The patient was adamant on getting the treatment only in the maxillary arch only.



Fig 1 : Note The Rotated Tooth No.7 And The Midline Diastema



Fig 2 : Pre Operative Arch Form

The teeth number 8,9,10,11 were bonded with the edgewise brackets (fig 3).After aligning the teeth , the space closure was achieved as shown in figure 4. In office bleaching was done with Opalescence Boosttm .

Intentional Root canal treatment was done for tooth number 7.



Fig 3: The Space Closure Inception Orthodontically



Fig 4 : After Space Closure

The crown preparation was done and a metal free zirconia crown was cemented .The final arch form (fig 6) was acceptable and the patient was pleased with the outcome of the

treatment (fig:7). The problem was resolved by limited orthodontic treatment followed by full coverage zirconia crown.



Fig 6 : The Final Arch Form Fig 7 : The Zirconia Crown Cemented to Tooth No.7



Fig 8 and 9: The Pre And Post Treatment Smile

Discussion :

Interdisciplinary, multidisciplinary and comprehensive treatment plans are now part of everyday practice ¹. The dentist has to be skilled to deliver such complex treatments. Precise orthodontic and restorative treatments must be carefully coordinated in the treatment plan to ensure final aesthetic outcome. (fig 8 and fig 9)

Conclusion :

Treatment approach with an interdisciplinary approach provides a better way with predictable clinical results for patients demanding good smile makeovers. With orthodontics and a restorative approach the goal was achieved in the above case.

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Separated File removal with a Ultrasonic file removal kits aided by operating microscope literature review and a study of 2 cases

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Abstract:

Objective: The purpose of this article is to show how removal of a separated (broken) endodontic instrument from inside of the root canal is possible with the help of specialized Endodontic Ultrasonic instruments and Dental Operating Microscope

Materials and methods – specialized endodontic ultrasonic instruments were attached to ultrasonic scaler devices and the tooth visualized under a operating microscope

Case reports: 2 cases are presented where endodontic ultrasonic instruments were used to remove broken instruments from inside root canals.

Results: Separated (broken) instruments was successfully removed from the root canal

Conclusion: A combination of high power magnification and ultrasonic endodontic instrumentation can successfully eliminate broken instruments and other obstructions from the canals.

Key-words: Broken instrument retrieval, file separation, instrument separation.

Introduction:

Case 1

A patient was referred with the issue that a Protaper file was fractured in one of the mesial canals of a lower first molar. Two intra Oral Periapical X ray Film was sent along with the patient. Figure1 and Figure2.



Figure 1

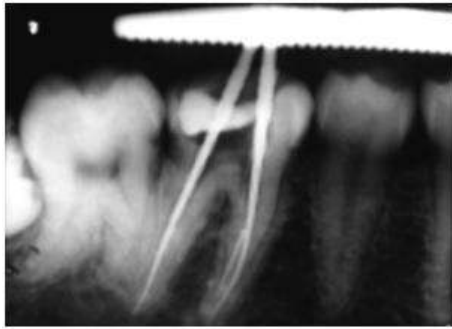


Figure 2

The referring dentist had been instrumented the other canals too but wanted me to complete the case after file removal.

An additional RVG radiograph was taken to confirm file position. Figure 3.



Figure 3

After Injecting an articaine local anaesthesia block the area was isolated with a rubber dam. The dental operating microscope was arranged for the procedure. The pulp chamber was opened and the canal was located. The first noticeable issue was that the access to the both the mesial canals was not a straight line access. The Mesial triangular ledge of dentin was as yet intact. The canals were wide as the lady was 22 years old and hence the access to apex had been obtained, but due to lack of straight-

line the instrument fractured at the bend in the mesio-buccal (MB) canal. The file was located in the apical third of the mesio-buccal canal which was seen only after the orifice of the Mesio-Buccal canals were widened after using Dentsply Start X Ultrasonic insets no. 1 and no. 2. It appeared that some attempt at retrieval had been made but was not success full. The canal was cleaned with 5% Hypochlorite and 17% EDTA. The fluids were sucked of with an suction tip attached with an empty syringe and a long 27 gauge needle. The remnants were blown dry with air from a needle attached to a 3 way air/water pressure syringe. The top side of the instrument was now barely visible as a shining spot. Now a Gates Glidden no 2 round drills with the safety tip cut off was mounted on a slow rotating turbine and was carried into the canal at about 400 rpm. (The procedure of cleaning and drying remains the same throughout the entire procedure and isn't repeated here for the sake of brevity.)

After a platform was created in the root dentin around the instrument a long tipped Dentsply Start X no 3 TM was used to ditch around the fractured file fragment. After considerable ditching was done, it was decided to call the patient for a second appointment. Calcium hydroxide was placed in the canals and a ball of cotton was placed in each of the canals and Cavit G TM was placed inside the pulp chamber. His occlusal level was checked to make the tooth out of occlusion. A second x ray was exposed. Figure 4



Figure 4

Second sitting – In the second sitting again the patient was anaesthetized and a rubber dam was placed. The CaOH was flushed out with saline and 17% EDTA as mentioned before. After drying the canal the file was again visualized and the Dentsply Start X ultrasonic tip number 3 TM was used around the instrument to ditch around it. At a time when the “deep reach” of the start X was inadequate then the Satelac Endo success kit TM was used to continue with the retrieval attempts. First the ET 20 was used in a anti clock wise direct around the broken file. When the “deep reach” was no more when the ET 25S was used in an anti clock wise direction and finally the ET 25 tip was used in an anti clockwise all around the instrument. The ultrasonic vibration was sent along the length of the file by wedging the ultrasonic tip between the dentin wall and the file⁶. This completely loosened the file fragment and it came out easily out after that. Figure 5



Figure 5

All the canals were instrumented with 2 % files to patency and after achieving a glide path a step back to a size 30 was done. Maintenance of working length was constantly checked on an apex locator. After a step back the final finishing of the canals was carried out with 5% Flare files up to a size of 30 in all 4 canals. A cone fit X-ray was taken which showed that the fine medium Gutta Percha was over extended in the Mesio lingual canal it was adjusted to a size of 40 diameters at the tip. Figure 6

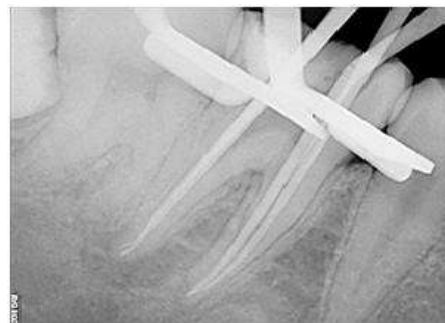


Figure 6

The canals were again irrigated with 5% warm hypochlorite and PUI was used in the canal then a 17% EDTA was used again as an irrigant again PUI was don for few minutes afterwards the canals was irrigated with normal saline and again irrigated with 2% Chlorhexidene Gluconate and then suction cleared and then dried with paper points by placing them in the canals for one

minute each. The canals were coated with AH plus sealer TM and then down packed with an E & Q plus Master pen TM. Next the canals were back filled with thermo softened Gutta Percha and condensed with Gutta pluggers. Then cavity space was packed with Cavit G. Figure 7.



Figure 7

Root canal filling up of all space inside the canals was seen in the x ray.

Case 2

The case showed below shows incompletely treated lower right first and second molars. Figure 8. The lower right second molar has a

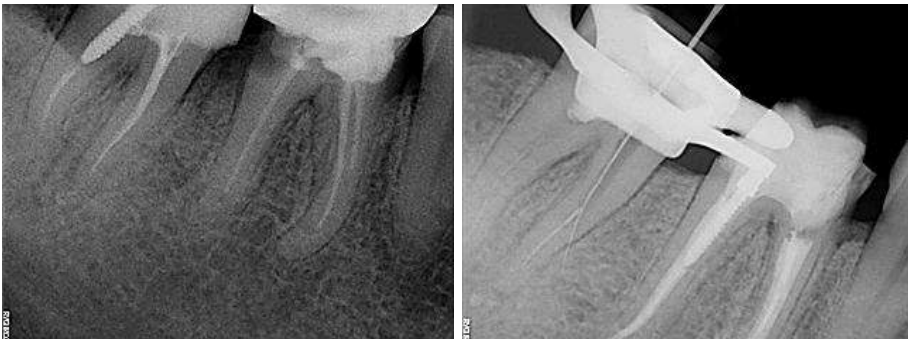


Figure 8, 9,

root canal filling which has a broken instrument embedded inside the mesio-lingual root canal filling of the second molar. The tooth has periapical radiolucency on both roots. Figure 8. In an attempt to remove the broken file a perforation had been caused in the mesio-lingual canal by the referring dentist. Figure 9. The Gutta percha was removed the apex was reached through the confluent mesio buccal canal. The perforation was sealed with MTA leaving the separated file in place. Figure 10. During the subsequent visit with the canal filled with hypochlorite passive ultrasonic irrigation with Satelac Irrisafe TM was carried out. That was followed up with 50% Citric acid and 17% EDTA. It was during the PUI in the mesio buccal canal when the fragment shown below came out without any conscious attempt to take it out. Figure 11. Root canal filling of the canals was done with apical down pack and coronal backfill with warm vertical condensation of Gutta Percha. Figure 12



Figure 10, 11 and 12

RESULTS Ultrasonic endodontic tips have proved their utility in eliminating obstructed intracanal obstructions like separated files and can be extremely effective when used with the aid of an operating microscope.

Discussion

In spite of all precautions breakages do occur. The reasons could be traced to metallurgical defects like cracks preexisting on endodontic file surfaces¹ which predisposed the file to separate (break) when passed through extremely curved canals due to rotational bending and flexural and cyclical fatigue^{1, 4}. Canal curvatures themselves are a big risk factor.¹

⁴ Cost of NiTi files demotivates clinicians from using new instruments for every tooth. Reusing endodontic files is a significant factor for instrument breakage due to fatigue^{2, 3}, and ⁴. Nickel Titanium endodontic files often give no forewarning for impending breakage like kinking or unwinding of flutes like in case of stainless steel files; hence NiTi file separation is often a sudden unexpected event². Other precipitating factors are the operator or his faulty endodontic technique² like for example instrumentation of dry canals without irrigants and lubricants like EDTAC gel or absence of glide path or jumping instrument sequences which have been established as predisposing factors to file breakage⁴. Inappropriate torque and rpm

setting as well as unsteady and fluctuating rpm as in Air motor hand-pieces have been already established as risk factors.⁴ Even a single use NiTi rotary endo file could shear. The visibility of the file is an important prerequisite for its removal. For visibility sufficient enlargement of the canal coronal to the broken file is an absolute must^{5, 6, 9}. That can be achieved with a Rosehead bur, a modified Gates Glidden, a modified Light speed TM or modified Profile TM instrument^{5, 6, 9} after gaining access to the coronal aspect of the file a staging platform around the instrument is created.^{5, 6, 9}

Extreme Apical separations are recommended to be left alone if the visibility access or reach are very difficult^{4, 5, 6, 7, 8}, and ⁹. In inaccessible instruments on difficult canals the canal above is recommended to be irrigated and soaked with irrigants like hypochlorite disinfected and then filled effectively burying the instrument.⁶

After access to the file in the canal the dentin around the file is ditched all around till a fragment of the file is exposed. This is continued till the binding point is reached

and then the vibrations are sent along the long axis of the instrument fragment after which it bounces or jumps out^{4,6,7,8,9}. The ditching is done in a dry canal as the wet canal will reduce visibility due to dentin mud slush.^{6,9}

In cases where it is possible, special instrument removal kits with tubes can be used to engage the broken files and physically pull them out.^{4,9} In the paper “A dozen ways to prevent nickel-titanium rotary instrument fracture” - Peter M. Di Fiore, DDS, MS mentions “The Masseran™

Endodontic Kit (Micro-Mega, Lynnewood, Washington), the Cancellier Instrument Removal System™ (SybronEndo, Orange, CA) and the Ruddle IRS™ (Dentsply, Tulsa, OK).” as some available instrument kits available for file removal.

In case that an instrument cannot be plucked out it can be bypassed by using dentin decalcifying agents like 17% EDTA and 50% Citric acid. After the dentin is softened it can be attempted to either bypass it or flush it out like it was done in the Case 2 presented above.

Conclusion

- Instrument breakage is a daily reality of endodontics which can be avoided often if precautions are taken
- Understanding why a breakage occurs will help prevent mishaps
- Successful techniques and special instruments have been developed for removal of separated instruments which can be effectively used to remove broken instruments
- Special Ultrasonic endodontic kits are amongst the most effective of the means available for the purpose like the Dentsply Start X endodontic tips™ and Satelac Endo Success Kit™ which have proved that they are effective means of removing broken instruments from canals. Satelac Irrisafe™ kit used for Passive Ultrasonic Irrigation can also help eliminate unbound loosened broken endo files
- It is tremendously important that ultrasonic instrumentation should be accompanied by the use of an operating microscope which will prevent further mishaps like perforations and be able to help do a precise job.

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