Abstract
This article is an account of a patient I performed an endodontic treatment on in general practice. It gives an account of the examination findings, demonstrates the thought process behind the treatment planning for this case and a description of the treatment done as well as the results.

Case Details:
Patient Details:
Name: CY
DOB: 12/05/1989 (24 yrs old)
Gender: Female
Medical History: Asthma (never been hospitalised for it)
Dental History: has been an irregular attender at a different practice
Social History: Smoker (10 a day) light drinker (socially 4-5 units a week).

Presenting Complaint:
CY attended the practice initially for a second opinion, as had been informed that the tooth was unable to be saved and would require extraction. The patient was also getting pain from her LR6, the pain itself was characterised by jump up to a 9/10 at times

HPC: The patient initially had pain from the tooth one month ago, but the pain then subsided

Examination findings:
EO: – Right Submandibular Lymphadenopathy, with mild tenderness
IO:
• Soft tissues – Tenderness to buccal palpation LR6
• Hard Tissues – LR6 TTP and grade 1 mobile, Occlusal caries seen LL6, LL7 and LR6
• Perio – BPE – 222, 422 (9mm pocket mesial LR6), OH – poor, 50% plaque score

Radiographic Report
• SITE: Right and Left, Upper and Lower, distal of 7’s to mesial of 4’s
• JUSTIFICATION: Caries detection and periapical pathology analysis of LR6

Special Tests:
• Vitality (sensibility) – LR6 non-responsive to Endofrost (-50oC)

Treatment Plan:
for a bit, to return much worse one week prior to the initial examination.

Patient wishes and expectations: I always like to gauge what the patient wishes to gain from the experience and make a habit of sitting with them for five to 10 minutes trying to gain the information required to help with any difficult decisions.

Right and Left Bitewings Figures 1 and 2

Endodontic Report - Jamie Nelson
This is the winning entry to the 2015 Young Dentist Endodontic Award
This Case: CY – “It ain’t over till the fat lady sings”
Path: Large PA area with furcation obliteration L6

Period: good bone levels, no subgingival calculus, PDL space widening around mesial portion of the tooth

Diagnosis of:

- Perio-endo lesion: True
- Primary endo
- Radicular cyst

To summarise the findings, the patient attended with a grade 1 mobile L6, which was TTP, had a 9mm pocket mesially and was negative to sensitivity testing. The LCPA radiograph of the L6 showed a very large periapical radiolucency surrounding the root of the L6, external root resorption around the mesial root, widening of the periodontal ligament (PDL) space mesially and furcation obliteration. With all of this in mind it leads us to a differential diagnosis of:

- Perio-endo lesion: - Primary endo
- Perio-endo
- Radicular cyst

With all the symptoms taken into account I came to a provisional diagnosis of an acute flare up of chronic periapical periodontitis, in which sinus drainage had been established through the mesial pocket.

Treatment:

- LR6 extirpation
- RCT on the LR6

So a treatment plan was drawn up and the patient happy for treatment to begin

Plaque Score
- 50%

BPE
- 222,422

Caries Risk
- High

Perio Risk
- High

Table 1

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<thead>
<tr>
<th>25/08/2012</th>
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<tr>
<td>Plaque Score</td>
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<td>BPE</td>
<td>222,422</td>
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<td>Caries Risk</td>
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<td>Perio Risk</td>
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apical twist back/tug back could be achieved (resistance to rotational or vertical displacement of the point once in place). Once that was achieved the point was marked at the coronal end, this leaves the point long, essentially overshooting beyond the apex, but giving an apical seal. This “overshoot” is then removed by once again measuring the GP and simply snipping off the excess from the apical end (figure 7). The shortened GP has essentially a custom thickness at the apex now and fits snugly into the canal, hopefully, achieving an apical seal.

The canals were then lined with Tubliseal and the GP cemented into each canal. GIC was used to line the GP as this provides a dynamic bond with the tooth, reducing the risk of GP contamination 6. The restoration can be seen in figure 8.

Once the restoration was complete, the post operative radiograph was taken (figure 9).

The radiograph shows that the GP is to length, has a good taper, good density and doesn’t show any voids.

Review stage: The patient attended her three-six-and-nine month review appointments and has demonstrated a huge improvement as summarised by Table 1.

Also during the nine month review, the nine month post op endodontic radiograph was taken (figure 10). The radiograph showed an almost complete resolution of the pathology and has demonstrated a successful endodontic treatment.

The Results Taking into account all of the above, the Table 1 shows a clinical breakdown of the LR6 comparing the pre and post treatment results, as well as both pre-operative and 9 month post operative radiographs.

This case demonstrates that no matter how bleak the outlook there’s always a possibility for success. I myself treat difficult cases with an attitude summed up very nicely by Henry Ford “Obstacles are those frightful things you see when you take your eyes off your goal”.

About the author
The son of a dentist and a former Kings College student, Jamie works part time in two practices. He trained at The Bromley Road Dental Surgery in Colchester and at the end of his training year, all the dentists in the practice decided to give up a proportion of their units of dental activity to keep him in the practice. It was here that he carried out the case which made him one of the winners of the award. He also works at a private practice in Basildon where his colleagues assign most endodontic cases to him.

References:
3) Clifford J. Ruddle - The ProTaper Technique Shaping the Future of Endodontics
Young Dentist Endodontic Award

Non surgical endodontic treatment of the maxillary right central incisor with incomplete root formation by Rupal Shah. This is the second place entry for the 2013 Young Dentist Endodontic Award

This report discusses the successful management of an 10-year-old patient, who required root canal treatment of her immature upper right central incisor, following a previous history of trauma. She was initially referred to the paediatric department at Birmingham Dental Hospital by her general dental practitioner. Following assessment and diagnosis, she underwent root canal therapy of her upper right central incisor, which was deemed to be non-vital and had an open apex.

Patient details
10 year old female, school pupil

History

Presenting Complaint: The patient's chief complaint was her 'fractured front teeth' which she did not like the appearance of.

History of Presenting Complaint: History of presenting complaint revealed that she had suffered trauma in November 2011, when she had fallen in the school playground and knocked her front teeth on metal railings. Both upper central incisors had fractured, but there was no obvious displacement at the time of injury.

No loss of consciousness or head injuries had been noted, but there was a laceration to the upper lip. She initially attended Heartlands Hospital, from which she was referred to Birmingham Children’s Hospital for a chest x-ray, as the tooth fragments had not been accounted for. The chest x-ray reported no abnormalities.

The patient then saw her GDP one day after the injury, and had adhesive compos-ite restorations placed on the URI and ULI. However, these were subsequently lost after six weeks, and were not replaced.

Medical History
The patient suffers from asthma, for which she uses Ventolin and Beconide inhalers, as and when required. She has not had any previous hospitalisations due to her asthma.

Dental History
There is no history of any other previous trauma. Co-operation appeared to be reduced as the patient had not had any previous extensive dental treatment, and was therefore quite nervous.

Examination

Extra oral
Scarring was noted in the midline of the patient’s upper lip; she had sustained a laceration to this area at the time of injury.

Intra oral
Soft tissues
Oral hygiene was fair, but some gingival inflammation was present.

Hard tissues
Teeth present were: 6EDC21 12CDH8 6DCD11 12CDH10

Unrestored enamel-dentine fractures were evident on the URI and ULI, with the URI fracture being fairly extensive. Caries was noted on the LL2.

Occlusion
Occlusal analysis revealed a class I incisor relationship with class 2 right molars, and class 1 left molars.

Special Investigations
All maxillary incisors responded positively to ethyl chloride. The URI tested negative. None of the maxillary incisors were tender to percussion and no labial sinus or tenderness, discoloration or mobility was noted.

Radiographic examination

Periapical Radiographs

Long cone periapical radiographs URI and ULI (Fig 1.1) revealed open apices on all maxillary incisors, and PDL widening around the apex of the URI. It also showed the unrestored enamel-dentine fractures on both maxillary central incisors.

Upper Standard Occlusal Radiograph
This radiograph confirmed PDL widening around the URI, with associated periapical pathology. It also shows the open apices of all four upper incisors, as well as the presence of maxillary canines.

Soft Tissue X-ray
The soft tissue radiograph of the upper lip revealed no abnormalities, and no evidence of any tooth fragments in the lip (Fig 1.5).

Diagnoses
1. Enamel-dentine crown fractures URI and ULI
2. Likely non-vital URI; chronic apical periodontitis secondary to trauma
3. Caries LL2
4. Anxious patient

Treatment options
1. Test cavity URI, and proceed to non-surgical root canal therapy with MTA plug if non-vital +/- RA sedation (Birmingham Dental Hospital)
2. The patient was quite nervous, so the use of RA sedation was discussed; a RA sedation information sheet was given to the patient
3. Extraction of the URI with or without prosthetic replacement (GDP).

Treatment plan
1. Immediate: cover exposed dentine URI and ULI with GIC (Birmingham Dental Hospital)
2. OHI, dietary analysis and advice, hiwtering radiographs (GDP)
3. Scale and polish, restore caries LL2, fissure seal 1st permanent molars (GDP)
4. Test cavity URI and proceed to root canal treatment if non-vital +/- RA sedation. Dress with non-setting calcium hydroxide until stable. (Birmingham Dental Hospital)
5. Adhesive composite restorations URI and ULI +/- RA sedation (Birmingham Dental Hospital)
6. Review (Birmingham Dental Hospital)

Treatment protocol

Appropriate verbal and written consent was obtained prior to commencing treatment. As a test cavity was carried out on the URI, no local anaesthetic was required. Isolation was achieved with dry dam, wedges and Oroseal caming material. The tooth, as expected, was found to be non-vital, and irrigated with sodium hypochlorite solution. The canal was then temporarily dressed with calcium hydroxide, a cotton wool pledget and GIC in the access cavity. After this visit, the patient felt less anxious, and opted to have future treatment without RA sedation.

At the next visit, the patient mentioned the tooth had been symptomatic. Therefore, it was decided to re-access and re-irrigate with 2.5 per cent sodium hypochlorite solution. The tooth was again temporarily dressed with calcium hydroxide, a cotton wool pledget and GIC.

At the following appointment, the patient was asymptomatic. The canal was re-irri-gated with sodium hypochlorite and dried with paper points. A master cone periapical radiograph was taken (Fig 1.5) to confirm the length, and a 4mm apical plug of mineral trioxide aggregate was placed using the Micro Apical Placement System (Fig 1.6). The remaining canal space was obturated with thermostabilised GP (Obluta) and sealer using warm vertical compaction. A Vitreline bonding agent was placed over the GP, and the access cavity was restored with composite resin to create an effective coronal seal (Fig 1.7).

Review

Fig. 1.1 Preoperative periapical radiographs
Fig. 1.2 Upper standard occlusal radiograph
Fig. 1.3 Soft tissue radiograph of upper lip
Fig. 1.4 Diagnostic radiograph to determine working length, 21mm
The patient recently attended for a six month review, which reported no symptoms associated with the UR1. With regards to the UL1, there was a query whether there was some periodontal ligament widening, however the sensibility tests were inconclusive and the tooth was asymptomatic. It was therefore decided to continue to monitor the UL1 for now, and review the patient again in a further six months.

Discussion
The patient’s traumatic incident had resulted in pulp necrosis of the UR1 and consequently an incomplete formation of the root. Effective cleaning of the canal walls was achieved with large K-flex handfiles, interdental brushes and sodium hypochlorite irrigation. The MTA technique allowed for successful obturation of the maxillary central incisor with an open apex.

I successfully completed this treatment in an anxious 10-year old girl, who had not had any previous extensive dental treatment. I overcame this by using different behaviour management techniques including tell-show-do, and ensuring that all appointments were not of too long a duration. This meant compliance was not lost. In fact, the patient initially began treatment under RA sedation due to her anxiety, but at subsequent visits, decided she no longer wanted it, and appeared to cope well without it.

Finally, I decided to submit this case, because I feel that I obtained an excellent final outcome, both clinically and radiographically. The tooth was symptom free at the six-month review appointment at Birmingham Dental Hospital. The 4mm MTA apical plug was to the correct length, and radiographically, there were no voids in the thermoplastic GP. The access cavity was sealed with a vitreobond lining, followed by adhesive composite restoration, ensuring a good coronal seal.

The endodontic prognosis for this tooth is good, however the patient is fully aware of the long term consequences of trauma, and the subsequent need for regular dental monitoring and sensibility testing of the traumatised upper incisor teeth.

References

About the author
Rupal Shah was on duty at Birmingham Dental Hospital’s paediatric department in April 2013. A foundation dentist in her second year of training, she had to treat a 10-year-old patient who was returning to the hospital for endodontic treatment on her UR1.
Case report by Lydia Harris
This is the third place entry for the 2013 Young Dentist Endodontic Award

This patient attended in pain from the UL5 and a diagnosis was made of symptomatic Apical Periodontitis. I was aware that the presence of an apical radiolucency, curved roots and a heavily restored crown meant that the tooth had a guarded prognosis, but as the patient was keen to keep the tooth we began root canal treatment. I placed rubber dam, accessed the tooth, located the canals, patency filed and irrigated.

At university I had trained by using the step-back technique with K files, and ProTaper hand files. I had started using rotary instruments in my DF1 placement and I attempted to use the rotary files to my corrected working length, but struggled to do so due to the canal curvature. I had struggled to get to grips with using rotary instruments in more curved canals and I therefore returned to using the step-back technique and K-files.

Upon obturation, I noted that something was awry as the Thermafil would not seat to length. I was aware that the GP was unable to negotiate the canal curvature and a radiograph showed that the gutta percha (GP) was not at length, and some had entered the 2nd canal.

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Fig 1 - Pre-operative Radiograph taken 15/04/2013
Fig 2 - Working length Radiograph taken 29/04/2013
Fig 3 - Mid-obturation Radiograph taken 20/05/2013
Fig 4 - Post-op Radiograph taken 20/05/2013

‘At university I had trained by using the step-back technique with K files, and ProTaper hand files’
In order to achieve a satisfactory result, I needed to remove GP using DMZ-IV and Pro-Taper re-treatment files. This was my first experience of removing GP using hand files and using EDTA to ensure that I could use the ProTaper files to length prior to obturation. I then obturated using Thermafil, and have subsequently restored the tooth using a porcelain onlay.

An S-shaped curvature or double curvature can make a canal very challenging to negotiate. I learned that using hand files initially can help prepare the canal sufficiently prior to using rotary files. I now know to approach curved canals like these with more caution, and to take time preparing the canals ensuring adequate mechanical preparation. I had never used re-treatment files before and I learnt to use a pecking motion and ensure visualisation of GP on the files. I now feel more confident in doing this and therefore more able to attempt re-root treatment in the future.

I chose a porcelain onlay to restore the tooth as it provided excellent aesthetics, cuspal coverage and also helped to preserve more of the buccal and lingual tooth present, which would have been destroyed had I chosen to perform a crown preparation. The tooth was in the patient’s smile line and she was very pleased with the aesthetic result. Overall, I was pleased with the end result of this root canal treatment and hope that the patient is able to retain this tooth for many years as a result.

I feel that this case helped me to develop my endodontic skills overall as it involved improving upon a myriad of skills. Firstly, my assessment of a case; I had not previously spent a long time analysing the curvature of the roots and the effect this would have on my method of root filling the tooth. Since this case I have become acutely aware of the need to tailor your technique to the type of roots present, including ensuring adequate access, the need for anticurvature filing, and the advantages and disadvantages of using rotary instrumentation in these cases. Secondly, it made me realise the importance of establishing the aetiology of any problems encountered. I realised that as my GP had not seated to length that I had evidently not prepared the canals adequately and by establishing this aetiology I could therefore improve the outcome by rectifying this problem. I have also realised that acknowledging your own limitations and competency is key in endodontics; I was aware that the initial treatment I provided was poor, but that rectifying it may be difficult. I therefore ensured I informed the patient that I would try my best to improve on the root treatment, but that should it be beyond my competency we would have to consider alternative pathways.

This case helped me improve upon my endodontic planning and also, the techniques involved in S-shaped root canals. It has encouraged me to realise that if an ideal result is not achieved initially, things can be improved upon and should not just be accepted.


**Harty’s Endodontics in Clinical Practice**, Bun San Chong, Fifth Edition

About the author

At the time of this case, Lydia was working in a Bristol dental practice as a foundation dentist, in her second year of vocational training.