

# Failing Crowns and Root Canals

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Patients present with many different conditions which can be treated by using varying numbers of methods. The art and science of dentistry, which is learned by clinicians over many years, is to make a determination as to when teeth are savable over the relatively long term and when it would be best to offer other solutions related to removing particular teeth. This is not an easy question to answer in some cases and in others it is a foregone conclusion that the tooth would be best treated by removing it and placing an implant or bridge. Any structurally compromised teeth must be assessed carefully in order to develop a clear prognostic opinion of the long term risks of the proposed treatment failing at a given point in the future.

The purpose of this article is to look at several cases within our clinical practice where it was determined that the teeth would be best served with an implant and implant supported crown versus attempts at restoring and maintaining the original tooth. Radiographs are used in this case series to show the types of cases that are not restorable. We feel that it is very important to have a clear understanding of where the line is drawn for this determination, because it has been our experience that far too many teeth are recommended for implants that could have been restored with root canals and crowns offering the patient a reasonable assurance of long term success.

In considering reasons for teeth to be non-restorable the following cases fall into various categories of conditions. They may be classified as follows:

1. Advanced caries especially under old crowns
2. Complete loss of crowns by caries or mechanical failure where insufficient roots remain
3. Root fracture with bone loss and chronic infection
4. Nonrestorable vertical traumatic root fracture
5. Advanced periodontal bone loss

The first case is a patient with severe caries under a crown which extends down into the root to such an extent that the restoration would need to extend below the bone level (Fig 1). The option to consider crown lengthening bone removal in an attempt to gain more tooth structure would result in a biomechanically compromise that would ultimately result in tooth loss either through a root fracture, recurrent caries, further periodontal bone loss or a combination of all of these. Therefore an implant or bridge is the better option. In this case the tooth was extracted and a bridge was recommended because the two teeth on either side of the decayed

tooth required crown restorations and there was a missing upper tooth opposing the back tooth (Fig 2). Another option that was considered was the placement of two implants in the #2 & #30 locations. In this case the patient elected the less expensive option of the bridge because the replacement of #2 was not deemed as being absolutely necessary.



Fig 1. The first molar has extensive caries under the crown extending down into the bone.



Fig 2. Note the missing 2<sup>nd</sup> molar that would allow supra-eruption of the lower 2<sup>nd</sup> molar in Fig 1 if it remains a stand alone tooth.

The second case to be considered is a case of front teeth where caries has extended well into over one-third of the root of a tooth with a large post (Fig 3). Even if this tooth had not the degree of decay present, it would have been recommendation for extraction and an implant. Also note the high caries rate of the teeth surrounding this tooth. These are also mechanically unsound teeth which will require extraction.



Fig 3. Severe decay under a front tooth  
With a large post extending into the root.

The third case was a patient who presented with severe decay under the upper second molar. Not only were the molars biomechanically compromised but they were in a very unfavorable tooth position to be able to place a 2<sup>nd</sup> molar implant only. It was recommended that both the 1<sup>st</sup> and 2<sup>nd</sup> molars be removed and that implants placed more vertically to correct the mesial angular collapse (Fig 4). The implants with custom abutments in place are shown (Fig 5) to show the angular changes that were achieved.



Fig 4. Severe decay under 2<sup>nd</sup> molar crown with  
mesial angulation due to lost 2<sup>nd</sup> bicuspid.

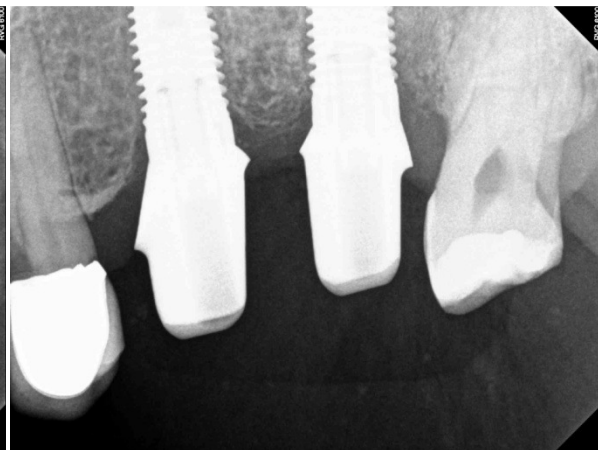


Fig 5. Note the corrected angulation of the  
1<sup>st</sup> and 2<sup>nd</sup> molar implants.

Case #4,5 & 6 show examples of complete crown failure where it is determined that there is insufficient root structure to support a crown restoration. In many of these cases the teeth are so weak that any increase in biting force causes a mechanical failure of the tooth causing the existing restoration to be lost (Fig 6-8).



Fig 6. Notice the lost crown and lack of tooth structure to be able to restore the tooth



Fig 7. This tooth has more root structure but has decay into the area between the roots making it prognosis poor.

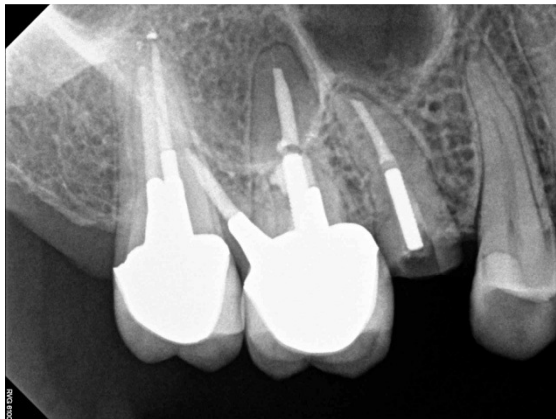


Fig 8. Lost crown with fractured post and insufficient remaining tooth for a predictable long-term restoration.

Cases #7 & 8 are examples of failing crowns and root canals due to root fractures that result in infection around the roots and progressive bone loss of the bone supporting the tooth (Fig 9-10). In past years these types of problems were treated by various surgeries to remove the offending root or repair the root with a surgically placed filling. Unfortunately these approaches have a much lower success rate over the long-term than placement of an implant. Therefore, today's approach is to recommend the removal of the tooth and placement of an implant with a new crown attached to the implant.

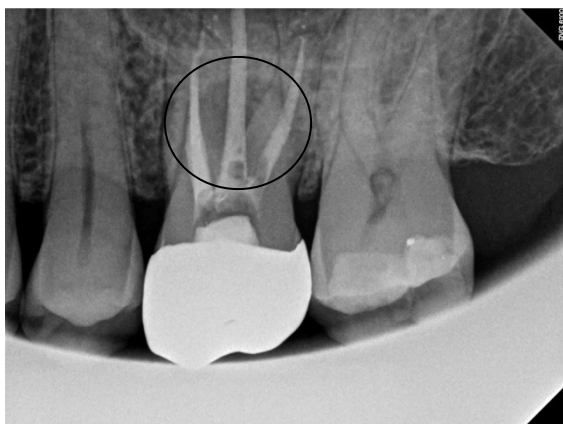


Fig 9. One of the 3 roots has a vertical fracture and infection in the bone represented by the dark circle



Fig 10. This central incisor has a vertical root fracture and had been surgically treated by two specialists prior to being referred for implant microsurgery and immediate provisionalization.

Cases #9 & 10 represent traumatic root fractures where the tooth is not restorable. Sometimes the cause of the trauma is physical cause such as automobile accident, bicycle accident or a fall. Other times this can happen when biting into something hard that causes the root to fracture. Ice, hard candy, foreign bodies in food and utensils are the most common causes of this type of fracture. Sometimes the patient doesn't even know when this has happened such as following case (Fig 11). Sometimes the crown falls out as the event which shows that there is a problem (Fig 12).

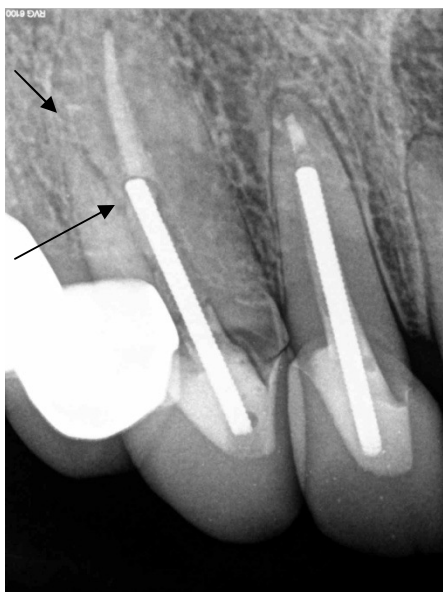


Fig 11. These teeth have been structurally compromised by the root canals, posts and crowns. This root is not savable and requires an implant replacement. The adjacent tooth may fail in the future if traumatized because of the small size of the root.

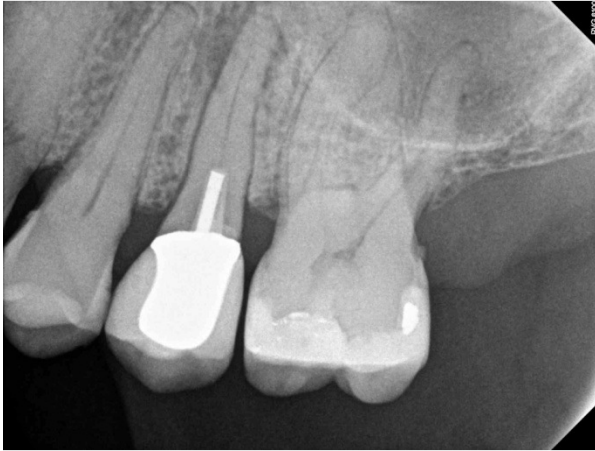


Fig 12. This crown failed at the seal between the crown post and the root. Note that no root canal had been completed previously and the abscess at the end of the root. The root is narrow and there is insufficient remaining tooth structure at the top of the root.

Cases #11 & 12 represent advanced periodontal bone loss in the presence of compromised roots and surrounding infection. Both cases demonstrate a very low prognosis for repairing the periodontal defects and therefore are recommended for extraction and implant placement. In the first case the tooth was extracted and the bone allowed to grow back to fill part of the defect prior to placement of an implant (Fig 13). In the second case there is so much horizontal bone loss that extraction, followed by bone grafting and implant placement in 3 stages may be required to develop sufficient bone volume to create the best result (Fig 14).



Fig. 13 The tooth on the right has severe bone loss between the roots due to periodontal infection compared to the other molar. An implant was later placed after extraction.

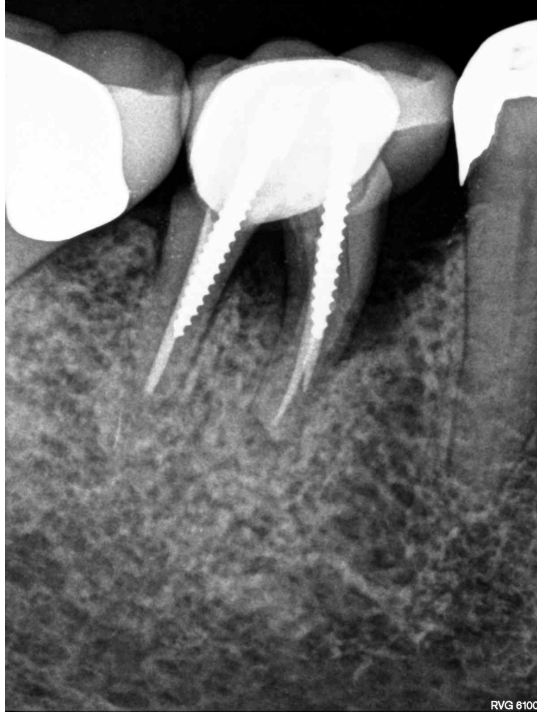


Fig 14. This tooth has severe periodontal bone loss in the presence of severely compromised root structure. The tooth was extracted to remove the infection around the roots and bone grafting will most likely be required increase the height of bone prior to implant placement.

The purpose of presenting this case series of 12 cases has been to help both dentists and patients understand the types of problems that occur around teeth which would most likely result in the need for extraction and implants. Generally in our practice an implant is always recommended as the preferred treatment over a bridge. However sometimes there are other overriding factors such as in case #1 where even though implants could have been done, a bridge became the better solution to prevent supra-eruption of the rear molar. The advent of implants for today's modern dental practice has certainly advanced the clinician's ability to restore patients failing crowns and root canals where teeth had previously not been salvageable. This has made the practice of dentistry very rewarding for both dentists and patients.

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