# Replacing THE EXTRACTED INCISOR

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**Treating advanced periodontal** disease is one of dentistry's most frustrating challenges. Since the treatment invariably involves improving oral hygiene it requires a 'team effort' between dentist and patient. Sadly, most patients usually have a history of poor motivation and compliance and many do not fully grasp the problem until a front tooth demands extraction.

If the replacement of this tooth can be managed swiftly and efficiently the incident can serve as a 'wake-up call' and a means of establishing trust and cooperation.

There are numerous ways of replacing missing teeth. All have clear advantages and disadvantages and it would be naïve to suggest that one constitutes a definitive technique. When numerous treatment modalities present themselves a helpful guiding principle may be a variation on Hypocrates' directive *'Above all, do no harm'.*

A tiered, progressive approach involves pursuing a simple, non-invasive treatment as the option of choice, while more complex, expensive and irreversible measures are held in reserve.

## SECTIONING AND SPLINTING

Mobile, symptomatic incisors commonly have neighbours with moderate alveolar bone support and acceptable medium term prognoses. Such teeth can sometimes be used as abutments against which an extracted tooth can be splinted back into the mouth.

This approach requires only one appointment and usually can be achieved without anaesthetic or preparation. It negates the need to construct a prosthetic tooth, whether direct or indirect, and ensures the subtleties of appearance exactly match the original. Psychologically it is comforting to the patient because, in a sense, the errant tooth has not been completely lost.

Splinting should be cantilevered, as with Maryland bridges since, when in function, anteriors tend to move in divergent directions.

There are two potential problems that must be considered.

Firstly, unless care is taken, the abutment can be subject to increased load, if not in centric occlusion, then during mastication. Often a number of posterior teeth are missing and anteriors are already being placed under disproportionate occlusal stress. This is especially critical if there is an element of bruxism. The 'pontic' must be adjusted free of the occlusion and, if possible, the posteriors restored to maximise their function during eating.

Secondly, it should be recognized that splinting with composite resin has physical limitations and can fail. Bonding is most reliable when large areas of enamel are adhered to and the bulk of material contributes tensile strength. The proximal walls of incisors are narrow and to achieve adequate bonding some composite must inevitably spill onto the palatal/lingual and labial surfaces. The challenge is then to make the teeth appear separate and distinct with the look of realistic embrasures.

## CLINICAL EXAMPLE

The patient was a 60 year old woman with advanced periodontal disease. The 21 was grossly mobile, overerupted, labially placed and in need of removal. The 22, 31 and 41 likewise displayed pocketing and moderate mobility.

The periodontal problems had been exacerbated by a lack of occlusal support distally. Only premolars occluded on the left and, on the right, the 46 had recently been extracted, resulting in the 16 making just a glancing contact with the 47 (Fig 3).

At the outset basic oral hygiene instruction was given but it was also decided to include antiseptics in a plaque control programme. Chlorhexidene is an effective antibacterial agent but it stains enamel and is inactivated by the lauryl sulphate in most regular toothpastes. Curasept market a range of chlorhexidene products and claim to incorporate an 'antistaining system'. The patient was asked to use Curasept toothpaste and 0.2% mouthwash.

The restoration of the posterior teeth included placing foreshortened bonded bridges on the right hand molars to improve interdigitation and support.

*Fig 1. The 21 was overerupted, mobile and in urgent need of extraction.*

*Fig 2. The mobility of the adjacent lateral precluded it from use as an abutment.*

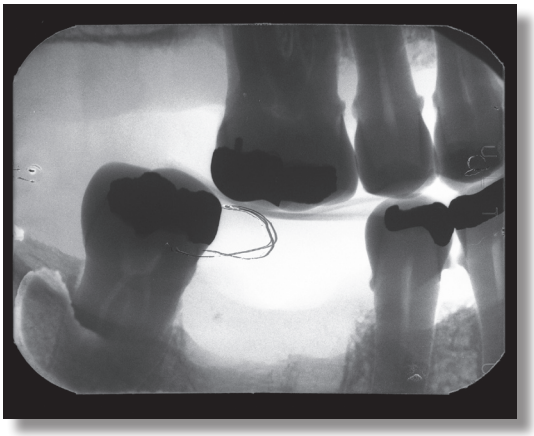

*Fig 3. Radiographs can be used to explain treatment plans.*

*Fig 4. Splinting may proceed when it is anticipated the extraction site will not undermine moisture control.*

*Fig 5. The root of the central was trimmed diagonally to resemble the tear drop configuration of a traditional pontic.*

*Fig 6. The pontic was shaped to abut into the extraction site in anticipation of future ridge resorption.*

## EXTRACTION, TRIMMING AND BONDING

It is usually easier to mask splinting away from the centreline because teeth can be readily placed in a slightly crowded position, obscuring the lack of a true embrasure. Unfortunately, the 22 had too poor a prognosis to act as an abutment so it was decided to utilise the adjacent central incisor.

The 21 was extracted and the patient duly returned two days later. (This second appointment could be made on the same day if it was anticipated bleeding would be minimal.)

The root of the incisor was trimmed to a length such that it would impinge slightly into the socket, recognizing that gum would recede in future. As with a traditional pontic the apical section was shaped to slope diagonally in a teardrop configuration. The pulp canal was prepared using a long diamond bur and then obturated with resin modified glass ionomer cement (Fig 5).

The mesial walls of both incisors were thoroughly cleaned, light pressure air abrasion being used on the extracted tooth but not its neighbour, for fear of irritating the extraction site. A small amount of trichloracetic acid was then applied to the gingival margin to limit seepage of exudate and both teeth were etched.

A range of composite resin, matching progressive shades of the teeth, was selected. Bonding agent was applied to both and the composites placed on the wall of the 11 abutment. The pontic was positioned against the tooth and the composite worked into full contact with finger and thumb coated with unfilled resin.

A sheet of freezer bag plastic was placed behind and, still supporting the tooth, the patient asked to close. Excess material was removed, a wedge placed cervically and basic contouring done, including the establishment of a centreline trough using the edge of a carver.

Following curing, the centreline was further defined, initially by aligning a long, narrow, fine grit diamond bur. In the cervical region dark tint was added to mimic shadowing. The bonding was thoroughly shaped and polished using discs and fluted burs. The occlusion was relieved for all but the most protrusive movements.

Resplinting the tooth required it fitting flush against its neighbour and closing any space between the centrals. This moved it away from the lateral, producing a small gap. To compensate the lateral was bonded mesially, creating a slightly broader tooth.

## FOLLOW-UP

Following the procedure the patient expressed an interest in having her teeth whitened. Cosmetics are always a secondary consideration to health and function but a serendipitous effect of bleaching is the bactericidal action of carbamide peroxide. Furthermore, when patients are happier with the look of their teeth they tend to care for them better.

Soft bleaching trays were constructed, covering all the teeth and extending 2 mm over the gum margins. Following bleaching, the patient was instructed to continue using the trays at night by placing chlorhexidene. Bleaching was to be repeated if staining became apparent.

## VARIATIONS ON TECHNIQUE

Correctly positioning and supporting the pontic during curing is difficult. It is invariably slippery and fingers obscure visualisation. There are a couple of ways to facilitate alignment.

If the tooth is in a satisfactory position before extraction a template can be constructed on the palatal surface, using heavy body impression rubber. Interproximal material is then trimmed away and the template later used to align the pontic.

Alternatively, a small tag or 'handle' of composite resin can be constructed on the incisal edge. Etching should be confined to a minuscule area and the tag quickly removed after splinting.

*Fig 7. The mesial wall of the lateral was bonded to close the gap created by the repositioning of the central.*

*Fig 8. Many patients have an aversion to removable prostheses. Utilising an extracted tooth as a pontic is often a simple and inexpensive means of addressing a clinical dilemma. Replacement of the missing incisor was accomplished in less than an hour.*

## CONCLUSION

The major challenge when replacing periodontally involved incisors is that most approaches either rely on, or coordinate with, neighbouring teeth which have limited prognoses. Any technique, other than a broad clearance, has an uncertain long-term outcome. A single tooth implant, for instance, may in a sense be deemed a failure if it is subsequently isolated by the loss of adjacent teeth.

If progression of pathology leads to the failure of a procedure, the distress, which results, is usually proportional to the time, effort and financial outlay which have been invested. The above technique, on the other hand, is atraumatic and reversible. It addresses an immediate, pressing problem and frees the clinician to concentrate on long-term management.