‘Long-Span Resin Bonded Bridges’

Two case reports demonstrating the successful replacement of four missing incisors

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BACKGROUND

A bridge is often indicated for the replacement of one or more missing teeth to restore function and aesthetics[1]. Historically, conventional bridgework was the mainstay treatment, although their use has steadily been declining, in part due to a reduced willingness to prepare minimally restored teeth and the increasing adoption of resin-retained bridges (RRBs) and implant-retained prostheses. However, although implants have become a favoured treatment modality in the replacement of missing teeth, there remain patients for whom implants are not viable (Figures 1 & 2).

Whilst RRBs are routinely used for replacement of single missing teeth, their use for larger spans is seldom documented in the literature, and among dental practitioners, there is an almost blanket refusal to condone fixed-fixed design. This mind set stems from a misunderstanding of a paper which reported greater success with a cantilever design. However, although a suitable conclusion for the population studied (many of the units were periodontal splints, hence partial debonds)[2], it was a conclusion that was taken out of context and adopted as a rule for all cases. More recently, this taboo over fixed-fixed designs is becoming debunked. Despite outcomes still favouring single-retainers, with good case selection, the success rates for fixed-fixed RBBs are very good, with RRBs used to replace the four incisors with single terminal abutments having a median survival of 53 months[2].

Figure 1: Ridge of patient CM showing inadequate bone volume for implant placement.

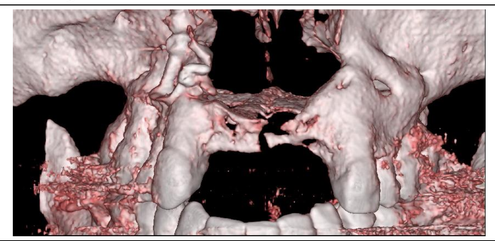

Figure 2: CBCT reconstruction of patient HS showing inadequate bone volume for implants

TREATMENT PLANNING & REQUISITES FOR SUCCESS

Occlusion	Light centric stop on pontics.[3]
Guidance	No contact on pontic in all excursive movements.[3]
Wing parameters	>0.7mm thick nickel-chromium alloy. Maximal enamel coverage, with ideally 180-degree wraparound of the abutment. Where possible, extending the retainer onto the incisal edge increases surface area for bonding and provides increased resistance against axial shear forces[3]
Connector parameters	Maximise connector height (increasing framework rigidity)– consider proximal preparation within enamel.[3]
Abutment tooth status	Unrestored, intact enamel, large bonding surface area.[3]

Success relies on bond strength and cement lute, therefore:

Bond to enamel	Minimally restored abutment	Reduce stress on cement	Rigid framework - maximise connector height
	Prepare tooth within enamel only		
	Avoid occlusal preparation - cement high where required		Limit path of insertion via proximal guide planes
	Strict cementation protocol, ensuring optimal moisture control		Extend over maximum available tooth
			Guidance on retainer

CASES

Patient CM:

21-year-old female who presented aged 17 to the LDI with congenital hypodontia of the upper 2’s and all lower incisors. She had worn a denture since 7-years-old. CBCT revealed inadequate bone for implant placement without block grafting. After MDT discussion patient underwent two years of orthodontics to align the upper arch (including de-rotating 4’s to act as canines), and de-rotate/intrude lower 3’s for bridge provision. Subsequently, a metal-ceramic 6-unit RRB was fitted.

Patient HS

62-year-old female with a history of a nasopalatine cyst enucleation 25+ years ago. A CBCT following trauma revealed a cyst of the anterior maxilla (oro-antral fistula) which was enucleated by OMFS. The patient had very little bone volume available for implant placement and therefore a denture was provided in the first instance. A 6-unit RRB was fitted however subsequently failed (Figure 3). This was replaced taking into consideration design principles which may improve success (Figure 4)

	Patient CM	Patient HS
Before Treatment		
After Treatment		

Figure 3: Previous RRB not optimising enamel coverage with suboptimal retainer thickness and connector height

Figure 4: Current RRB with maximal enamel coverage, thicker retainer and increased connector height

CONCLUSION

- Minimal available supporting evidence
- Requires good treatment planning and careful case selection for success
- Whilst risk of failing is >2x of a cantilever RRB, failure is less catastrophic than that of a conventional bridge where failure may result in apical pathology / caries / abutment loss[4]

REFERENCES