



Tooth loss is as old a problem as mankind itself. There is some evidence that almost 2000 years ago the Myan civilisation had fixed replacement teeth in the form of shell fragments hammered into extraction sockets. Whilst it may not have been the start of evidence based dentistry as we now know it, the placement of dental implants directly into extraction sockets poses some interesting challenges.

A healthy functioning tooth with healthy periodontium will generally maintain good bone levels. A dental implant should be capable of a similar ability to maintain bone levels over the long term. There are mountains of 'evidence', granted much of it questionable, however the consensus is that dental implants have the ability to maintain local bone through 'osseintegration'. This ability of bone to functionally lock onto the implant surface not only enables superstructure connection and thus restorability, but is essential in maintaining the local bone. So can an implant placed into an extraction socket maintain the local bone to a greater degree than a socket without an implant?

It's an interesting problem. We know from Arujio and Lindhe (M, Linder, & Lindhe) that approximately 30% of the alveolar bone width will disappear following the extraction of a tooth, regardless of any 'socket preservation' they tested, although they did raise a full flap at each site which would lead to bone loss anyway. They have recently published the data on flapless extraction, which has not provided any clear benefit to bone levels (Araújo & Lindhe). That may be a biomaterial designed to be replaced with bone, such as the commonly used bone substitutes, or a non-replaceable biomaterial designed to integrate into the host bone, for example a dental implant. This highly active academic group, are tremendous advocates of beagle dogs, by necessity this type of research benefits from a standard model. In spite of this evidence biomaterial placement into extraction sockets appears popular.

What this series of experiments did not demonstrate was the effect of immediate loading with an immediately placed dental implant. The theory should support the postulation that minimally loaded bone is less likely to be resorbed, and therefore immediate loading would maintain a greater volume of bone. Of course the immediate placement and loading issue generates a whole cloud of steam from various quarters, through which we need to look beyond. It is true, immediate placement and loading has difficulties, not least of which are implant stability and local bone volume. A greater problem may be uncontrolled forces, which is difficult

enough a concept with intelligent lifeform *homo sapiens*, I can only assume that it is easier with your average Norwegian beagle.

Many would argue that immediate placement is less predictable and therefore a more risky undertaking in the aesthetic zone. This is where the macroscopic design of various implants has come of age. All major implant companies have long since realised that a roughened surface will provide enhanced osseointegration. The challenge has progressed to the management of the critically demanding aesthetic case, where a decision has to be made – timing of implant placement (Schropp & Isidor). As clinicians we can have some control of this aspect, which can have significant impact upon the outcome of a case. The problem is that we may be unable to predict the impact of our decision. As is so often the case bone is the issue, yet our gingival aesthetics will be the measure of success. More bone, especially labial, the greater the options and the less influence the other factors will have on outcome. So for an immediate placement what would we choose? Primary stability is crucial with immediate placement. To achieve this implant must engage with native bone, requiring engagement out of the socket walls. This may be apical, in areas where bone dimensions allow, or often palatally in the anterior maxilla. The hardness of the palatal bone often leads to the infuriating ‘buccal drift’ effect. A large thread on the implant will engage more bone more readily. This type of thread pattern is a major benefit in immediate placement. In some designs anticlockwise rotation of the implant can increase bone compaction, leading to increased primary stability. Immediate placement when there is good thickness of bone and plentiful soft tissue, immediate loading when forces can be controlled. Beware of the dog.

References

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