Dental implantology: Evolution or the road to ruin?

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Teeth are highly evolved structures that have developed progressively over millions of years in attempts to protect the great teeth from caries and periodontal diseases. Over the years many advances have been made which can treat these various diseases predictably. Various strategies have been developed to prevent or slow down these problems given enough patient compliance and appropriate personal and professional maintenance. Despite these very significant improvements there are still instances when patients get told ‘this tooth or these teeth need to go’. It is the obvious sadness, heartache or despair that patients are caused by the bad dreams that has driven caring clinicians to find ways to replace teeth with various devices from dentures, to bridges to implant retained prostheses.

P. I. Bränemark, now sadly deceased, famously quipped ‘No one should have to die with their teeth in a glass of water beside their bed’. Bränemark’s original inspiration coupled with determination, intuition, passion and an ability to surround oneself with individuals with differing skills made osseointegration much more predictable. Bränemark’s landmark studies changed prosthetic dentistry dramatically but a careful look at the design of these protocols and the implants themselves reveal were hugely different to the patient selection protocols and the types of implants being placed today. Furthermore, the restorations supported on them were made of the established materials then and obeyed traditional mechanical laws. In terms of biologic cleanliness, the metal polished ‘highway’ abutment design allowed for optimal interproximal cleaning whilst the implant surface itself was also relatively smooth in comparison to the rougher surfaces we often see today. Market saturation, cost, profit, and market share in many technological driven markets often drive innovation of some companies to help gain greater market share or profit. The over commercialisation of dentistry generally creates a constant turnover of supposedly ‘new and better’ products where the common quote ‘If it ain’t broke don’t try to fix it’ is lost on many directors of marketing or increasingly profit driven CEO’s.

Why and where?
The searching question needs to be asked, “where has this technological financial taken implantology and what are the real reasons why this was and is happening?” Increasingly, the shadow of perimplantitis looms like a spectre over the provision of implants. Unlike caries or periodontal disease there is very little consensus or research that can provide a predictable cure for what now is now a new breed of diseases. Periimplantitis is resilient once established within fine threads of the implant and the bone resorption and soft tissue changes that follow can result in spectacular problems. Part of the key issue probably lies in the surface exposed to the susceptible patient’s oral environment, as most microbiologists will allage. The bacterial content and make up of the bio film is a reflection of the surface that it resides on. Implant surfaces have become progressively rougher in order to hasten the early osseointegration processes and to try to provide patients with their restoration quicker in an ever more competitive financial environment. However speed is not always helpful. Experience shows that some things are better taken slowly over time rather similarly to making love.

Once exposed to the environment of a susceptible patient the macro topology of the threads provide an ideal eco-nich for bacterial proliferation. Further nano-level features make the implant surface a veritable ‘invasion super highway’ for the pathogenic organisms. Predictably enough the microorganisms found on the rough surface are usually the common pathogenic ones but also some species are found that have previously never been discovered in the oral cavity.

Patient selection issues
We need to consider the types of patients for whom we are now accepting for implant provision. At Kier’s we have developed criteria for state sponsored implant provision largely involves patients with hypodentia and those who have suffered trauma. Usually both cohorts are likely to present with maintained minimally restored dentitions or with scope for oral health improvement prior to the considerations for any restoration let alone an implant. Unfortunately we are unable to provide this treat-ment for smokers. This is in stark contrast to patients who may be provided with implants in general and specialist practice for patients who are likely to have lost teeth as a result of plaque associated diseases. Indeed it could be consid-ered a paradox by many interested observers that some clinicians are providing patients with implant retained restorations when they have shown that they are highly prone to plaque associated disease via tooth loss and have not demonstrated any real capacity for chang-ing that. Patients who smoke, those with a history of periodontitis and those with poor oral hygiene are well known to be at a very significantly higher risk of peri-implantitis (Alani et al. 2014).

Biological versus mechanical problems
If we are being frank the pathogenic bacterial induced diseases are not the only long-term problem that we now see. The reported frequency of mechanical complications has risen over the years but the reported problems are probably only the tip of the iceberg as many complications have not and will not be reported for a variety of understandable reasons.

Over time the components of implants have shown notable weaknesses. Screw loosening, fractured abutments, loose abutments and the cracking of ceramic can be laborious and expensive to manage. One aspect, which may be just on some is that, lacking a periodontal ligament implant dental implants, cannot and will never be able to acclimatise to changing occlusal and non-axial forces. These are very likely to create stresses within the masticatory system thereby resulting in breakages. These forces are compounded greatly if patient’s parafunction on a daily basis and that is sometimes an unknown risk factor until it is too late. The more implants that are placed usually the fewer teeth are present resulting in a net reduction in physiological feedback and thereby creating an increased chance of failure of some type.

Ethical, moral and legal issues
These problems become much more worrying when viewed from ethical, valid consent and medico-legal perspectives. This is particularly so when patients are arrived to undergo elective extractions of teeth which often seem reasonably intact and/or treatable with conventional proven treat-ment strategies. It seems that there is a worrying drift towards aggressive treatment with extractions in order to provide a supposed ‘full mouth rehabilitation’ with multiple implants. The increasingly dubious practice of sacrificing teeth for the sake of implants seems to many concerned clinicians to be quite irrational. As ethical oral health prac-titioners, deliberately removing savable teeth for prosthctic re-placement using implants as sup-port seems to be consciously flying in the face of increasingly apparent evidence of various complications with implants and many would consider that approach to be foolish. How many ‘implantologists’ doing that to others would genuinely have it done to themselves or done to some close family member?

Planned obsolescence
A state of the art implant today is very likely to be obsolete tomorrow. Electri-vably removing teeth is irreversible and replacing teeth with implant retained devices means that patients that are trapped in the era of Implantology in which these were placed and restored, that means issues of machining, surface blasting, roughness, platform switching, design and attempts at bone augmentation by cow, coral or Californian substances. The list goes on and on and will probably continue to expand with what many would call “human experi-mentation without licence”.

Now comes the time for implant manufacturers to take stock of their many “market driven” mis-takes including “fast initial integra-tion with the roughest possible sur-face”. Instead they need now to produce proven (i.e. not specula-tive) designs to better prevent many known problems of infection and breakages.

A wiser, pragmatic approach seems to be to concentrate every-one’s efforts on saving teeth and thereby eke out their usefulness for the patients’ lifetime. Recently, the legendary Jan Lindhe writing in the British Dental Journal summarised the state of play as ‘There is an overuse of implants in the world and an underuse of teeth as targets for treatment’. 

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