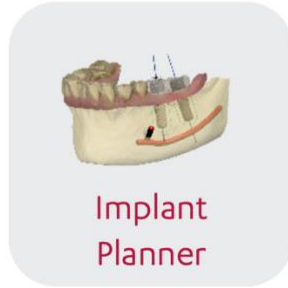


AUSTRALASIAN RESTORATION AND IMPLANT ACADEMY

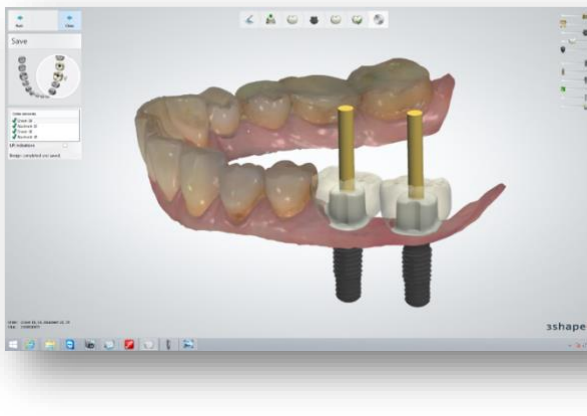


Accuracy of Surgical Guides

Introduction



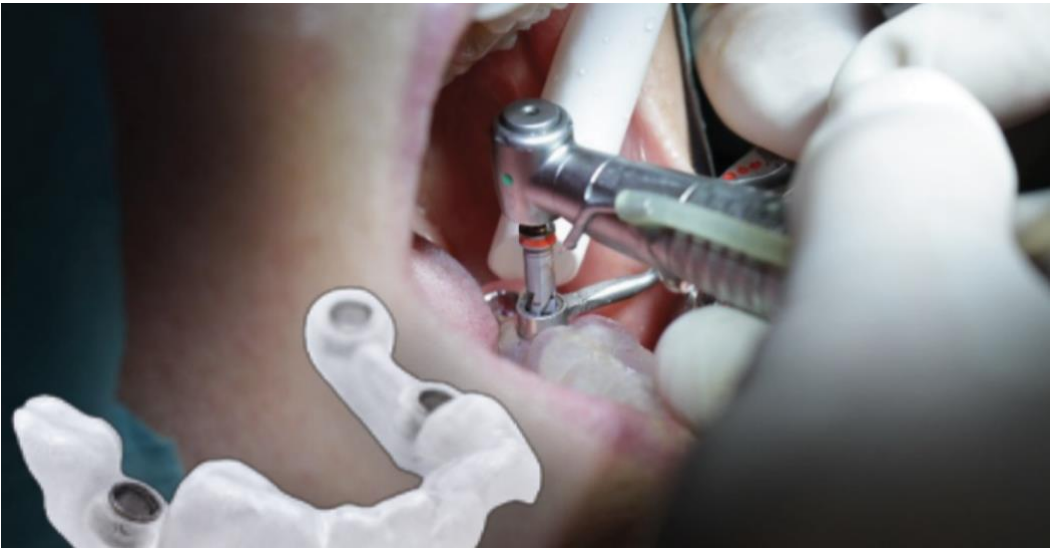
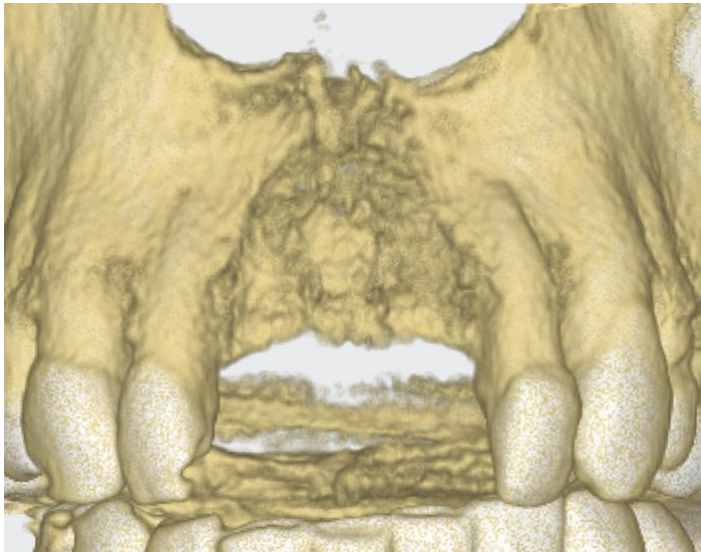
Implant retained prosthesis has become a highly reliable and widely available treatment modality in the restoration of single or multiple missing teeth. The use of surgical guides has reduced inaccuracies and improved the planning of the surgical procedure of implant placement. Prosthetically driven implant placement is considered the gold standard in the pre-operative planning and placement of osseointegrated implants.



Consideration of implant treatment can only take place once a thorough examination and management of disease has taken place. When considering surgical guide planning and its uses there is a key differentiating factor to the approach one may take. Dentate patients are managed differently to edentulous patients when considering surgical guide planning.

In partially dentate patient, a virtually computerised prosthetic wax-up or a scanned analogue wax-up can be overlaid with the CBCT scan in order to fabricate the surgical guide. Furthermore, use of a digital scanner will enable visualisation of soft tissues and dental architecture which can also be imported into implant software for further planning.

In full arch cases, prosthetic wax-ups can be completed digitally using smile design software or with fabrication of a traditional full denture. If completed in an analogue format a CBCT of the denture must then be taken with radiographic markers. This can then be overlaid with a CBCT of the patient wearing the denture with the same radiographic markers.



ACCURACY IS EVERYTHING

What does the research say?

When comparing dentate and mucosa supported surgical guides, the research indicates that dentate guides show a greater accuracy in final implant position. Geng et al. illustrated the mean deviation at the apex of the implant to be 0.37mm +/- 0.35mm and 0.94mm +/- 0.75mm, when comparing tooth supported and mucosa supported guides respectively. The increase in standard deviation also exemplifies the increased predictability of tooth-borne guides.

Moreover, when considering partially guided and fully guided surgery, minimal to no differences are observed. However, this is a contentious topic at current, as several other publications have shown clinically significant differences between partially and fully guided systems in favour of fully guided.

When considering operator experience vertical deviation from proposed implant position was twice as likely in an inexperienced clinicians' hands versus that of an experienced clinician. This brings to light the idea of using fully guided protocols, and the experience level of the clinician. Experience, education and understanding play an integral role in the execution of implant placement.

A wide range of factors impact implant placement and the accuracy of a surgical guide. The importance of case analysis and application of appropriate protocols for that case should be applied.

In conclusion when comparing mucosa supported stents to tooth supported guides, mucosa supported stents have an increased risk of movement during surgery, and thus reduced accuracy. Similarly, free-end implant placements also have a higher degree of deviation in placement, relative to planning. Single tooth replacements show a significantly lower angular deviation and higher placement accuracy.

At present, computer-aided surgical planning of implant placement provides several advantages to clinicians of varying experience levels. However, deviations must be expected and minimised with accurate pre-surgical planning and understanding of the limitations of each individual system.

A wide range of factors impact implant placement and the accuracy of a surgical guide.

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Head of Faculty:

Dr. Nathaniel is a specialist prosthodontist in full time private practice in Glen Waverley, Moonee Ponds and Berwick. Praveen has been restoring over 10 systems over the last 27 years and placing 5 systems for the last 13 years.

Dr Praveen is a National leader in Implant dentistry and is at the forefront of education and teaching in the field.

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