IMPLANT DISTRIBUTION IN THE EDENTULOUS MANDIBLE: A CBCT ANALYSIS

Hendawi A[1] · Nedelcu R[1] · Akhondi S[2,3]· Hamilton A[1,2]
[1] *Department of Prosthodontics, UWA Dental School, The University of Western Australia*
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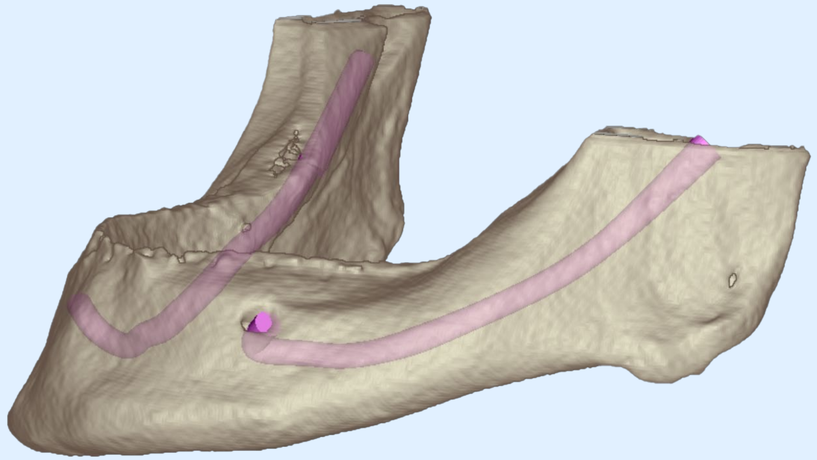
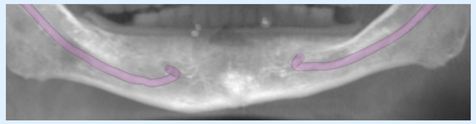
Ahmad.Hendawi@uwa.edu.au

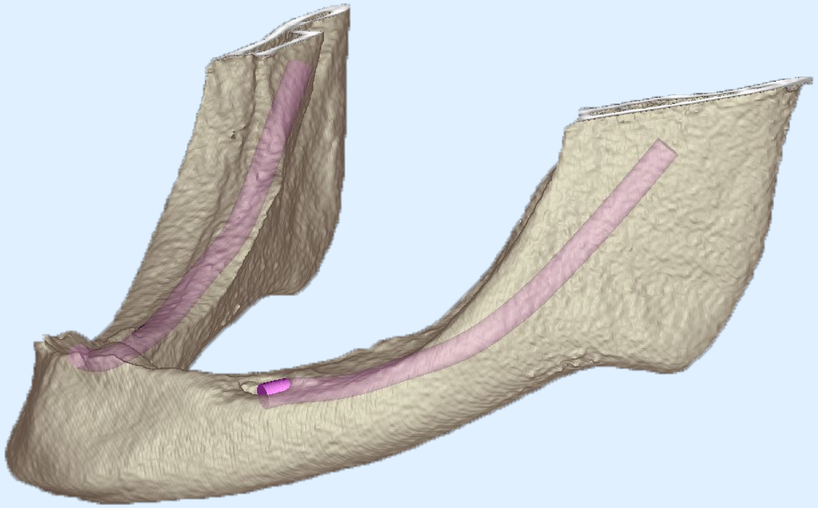


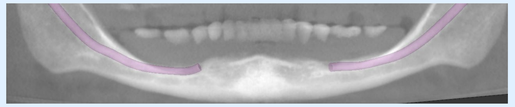


In edentulous patients posterior bone resorption and nerve proximity restrict posterior implant placement
This limits A–P spread and increases cantilever

56 edentulous mandibles analysed using CBCT-based virtual planning

BACKGROUND





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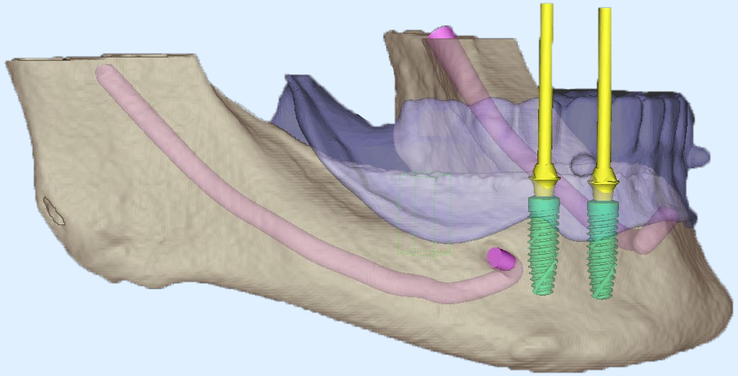
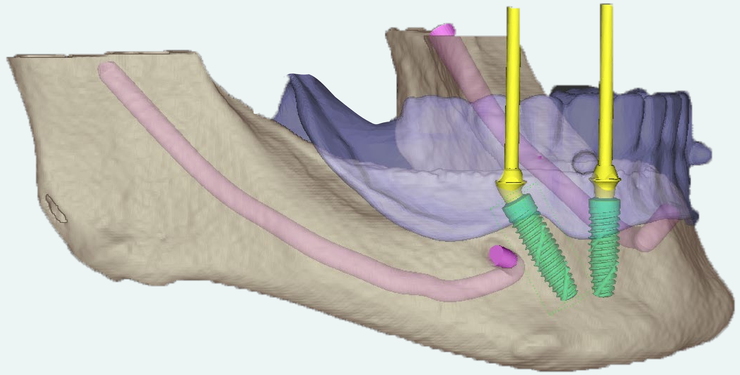
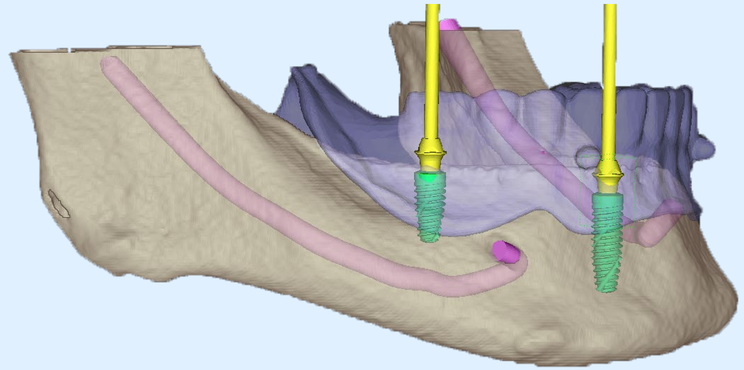


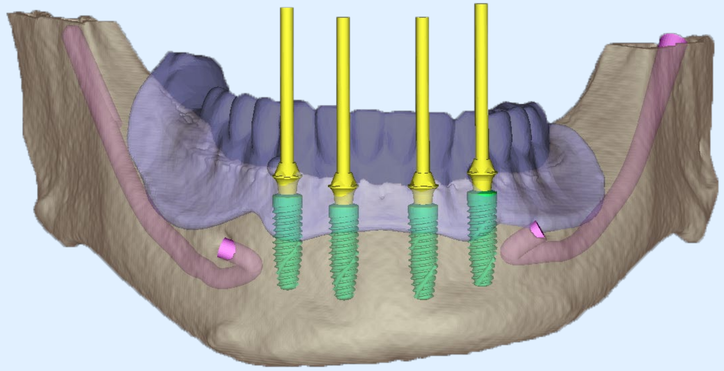
Group 1: Axial inter-foraminal

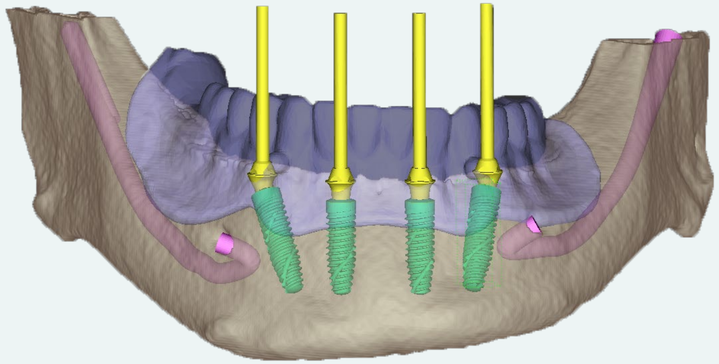


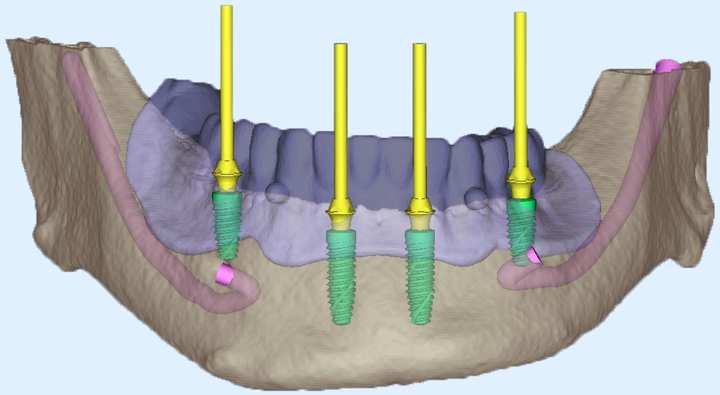
Group 2: Distal-angulated inter-foraminal (30°)



Group 3: Axial distal-foraminal







Each mandible was planned bilaterally in coDiagnostiX®, using Dual scan technique

STUDY GROUPS

IMPLANT DISTRIBUTION IN THE EDENTULOUS MANDIBLE: A CBCT ANALYSIS

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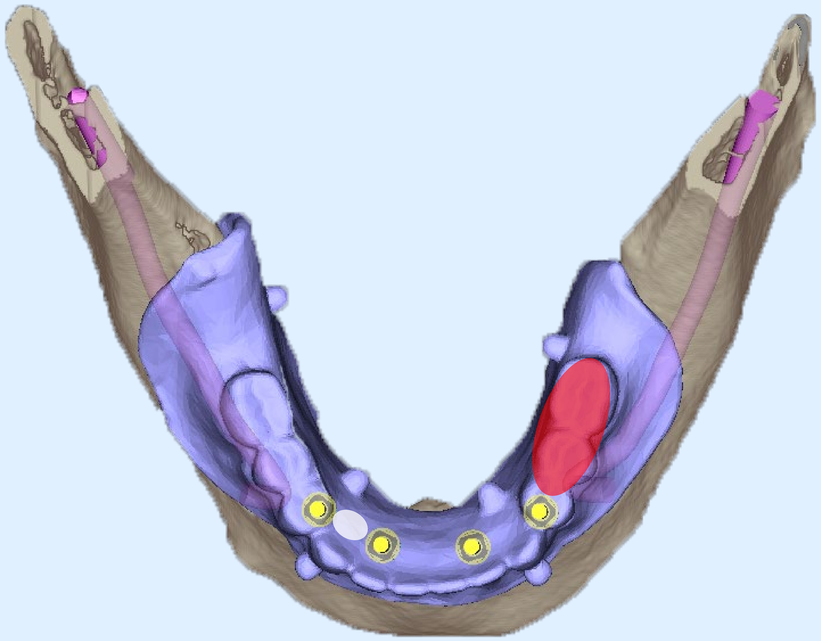

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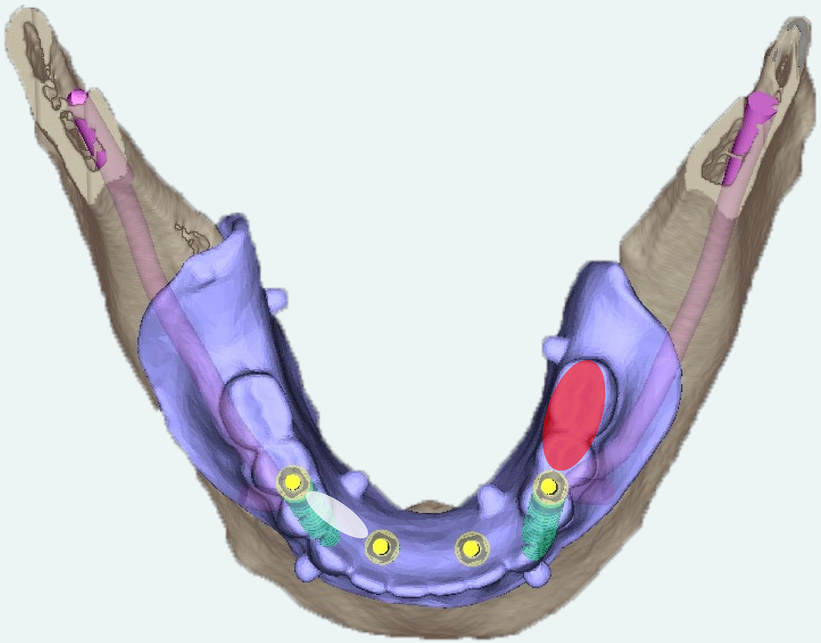
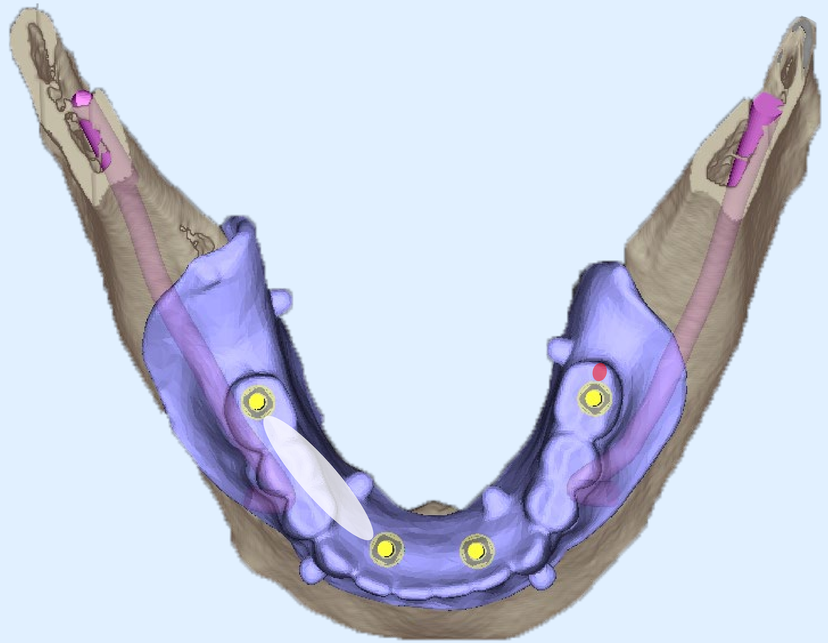


Group 2: Distal-angulated inter-foraminal (30°)



Group 3: Axial distal-foraminal

Anterior-Posterior Spread Area, Cantilever Length, Augmentation Needs (Anatomical Deficiency) and Implant Length

MEASUREMENTS

IMPLANT DISTRIBUTION IN THE EDENTULOUS MANDIBLE: A CBCT ANALYSIS

THE UNIVERSITY OF WESTERN AUSTRALIA

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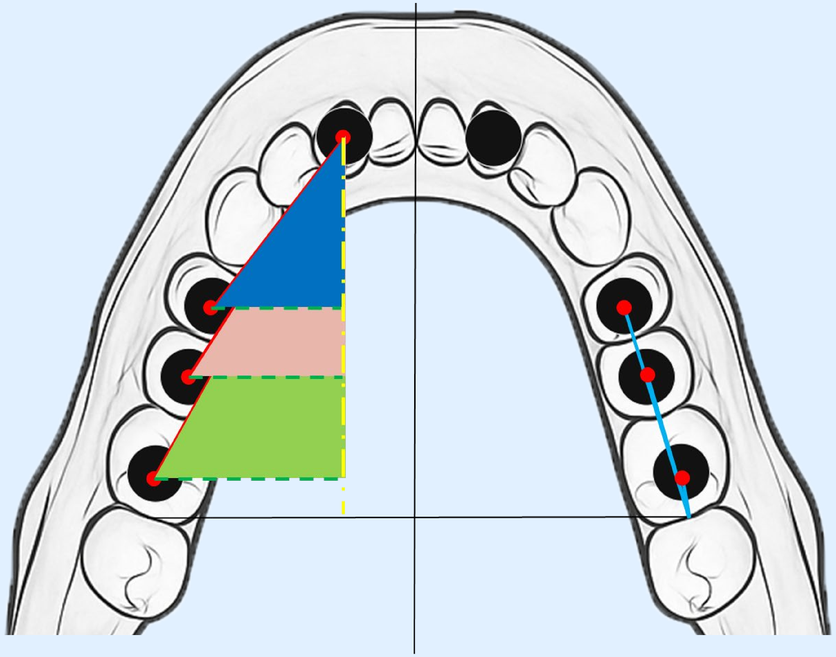


Implants

AP Spread Area

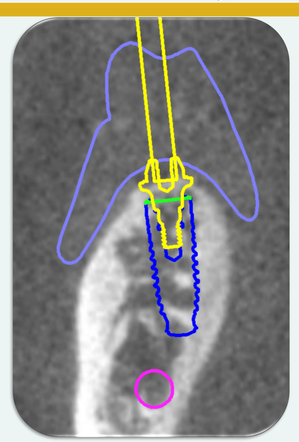
Cantilever Length

Oblique AP Spread

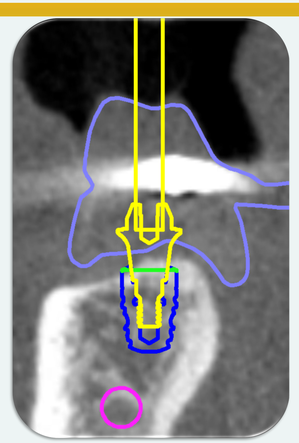
Transverse AP Spread

Sagittal AP Spread

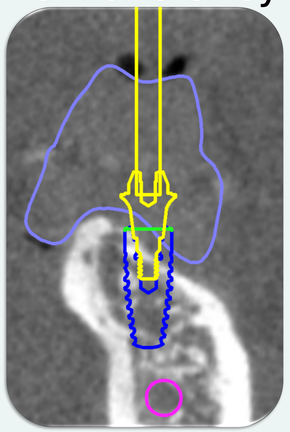
Transverse and sagittal planes



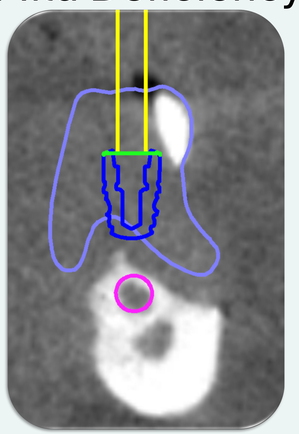
No Deficiency



Mild Deficiency



Moderate Deficiency



Severe Deficiency

Outcome	Group 1	Group 2	Group 3
A–P Spread Area (mm^2)	33.4	56.6	182.9
Cantilever Length (mm)	18.4	14.8	2.2
Severe bone deficiency	0.0%	0.0%	40.2%
Mild–moderate deficiency	35.7%	18.8%	22.3%
Implant Length Mode (mm)	14	16	6

$p < 0.001$ for A–P spread and cantilever

Distal-foraminal placement dramatically increases Anterior-Posterior Spread and reduces Cantilever length

RESULTS

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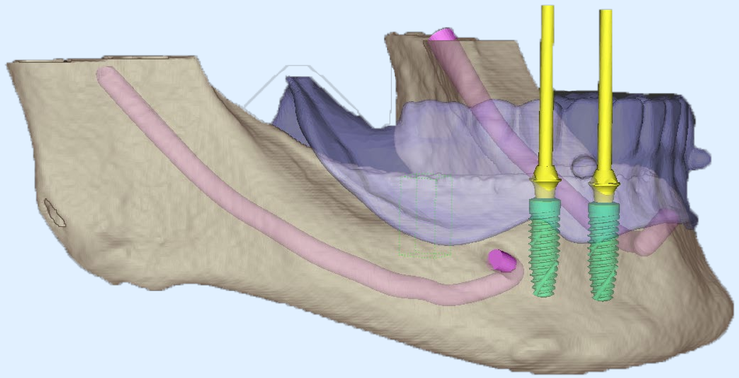
In patients with edentulous mandibles and varying degrees of ridge resorption, posterior implant distribution has a decisive impact on anterior–posterior spread and cantilever length. Axial distal-foraminal placement provides the most biomechanically favorable configuration when posterior anatomy permits, while distal-angulated inter-foraminal placement represents an effective and predictable alternative when posterior anatomy is limited, offering clear advantages over axial inter-foraminal placement.



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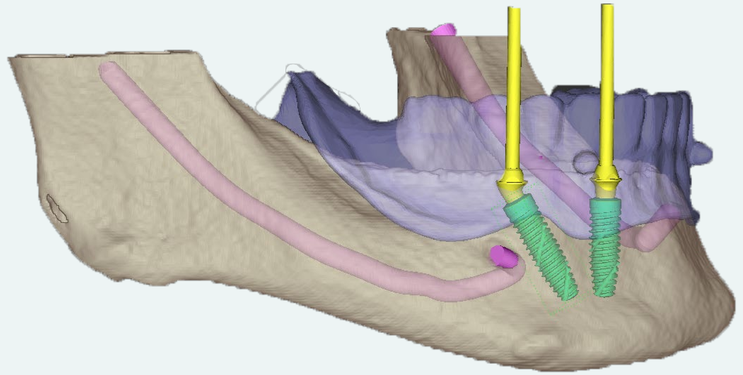

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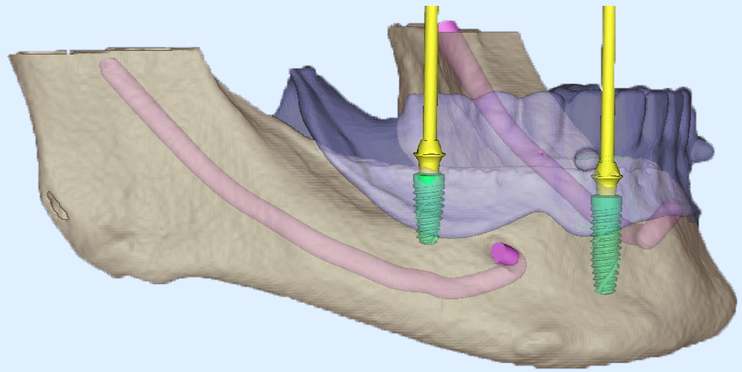

Group 3: Axial distal-foraminal

CONCLUSION