



Guided virtual surgery *versus* conventional technique: A split-mouth randomized clinical trial

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Objective

Guided virtual surgery (GVS) has as premise a better accuracy for dental implants placement. However, the reproducibility of the implant planned position by means of surgical guides is still under investigation. This study had as objective to assess the angular and the linear (point of entry and apical extremity) deviations of single-tooth dental implants placed by two different techniques: GVS with CAD/CAM stereolithographic guide and conventional surgery (CS) with handmade guide.

Materials and methods

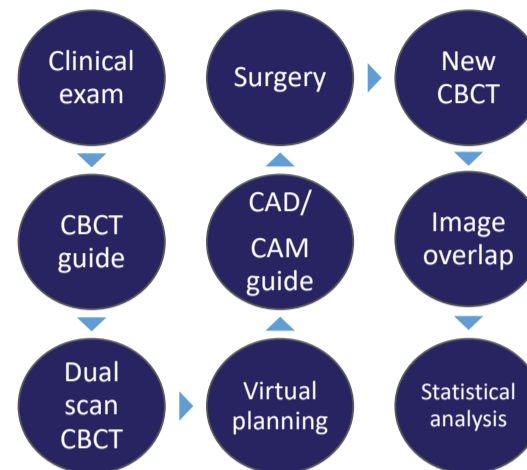
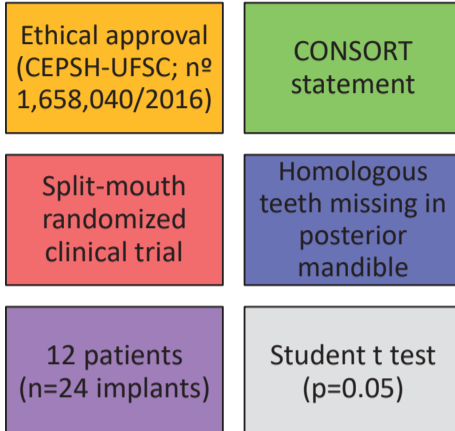


Figure 1 – Study design.

Figure 2 – Study protocol.

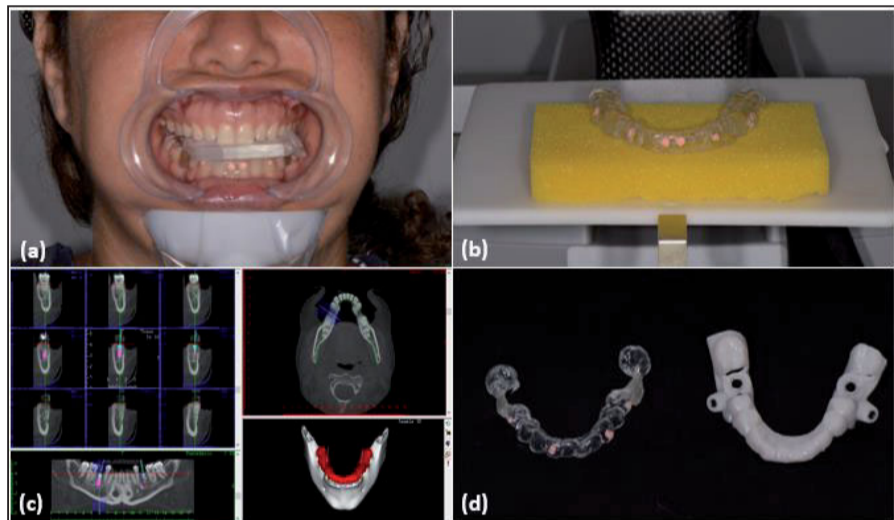


Figure 3 – (a) Patient prepared to CBCT scanning; (b) CBCT scanning of the scan appliance alone; (c) virtual planning; (d) conventional surgical guide (left) and stereolithographic surgical guide (right).

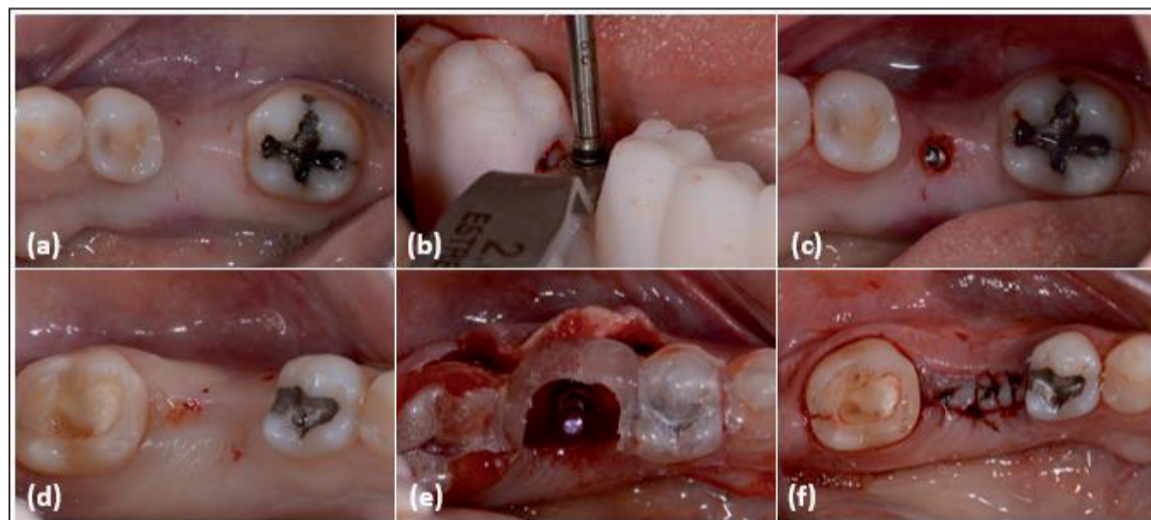


Figure 4 – (a) Initial view of GVS technique; (b) site preparation (guided protocol); (c) implant placed (flapless approach); (d) initial view of CS technique; (e) site preparation (conventional protocol); (f) final view of the surgery.

Results

| Parameter | Total |
|-----------------------|----------|
| Total of patients | 12 |
| Total of implants | 24 |
| Female/ Male | 11/ 1 |
| Age (years) mean ± SD | 42 ± 6.0 |
| Premolars (implants) | 8 |
| Molars (implants) | 16 |

Table 1 – Demographic data.

| Parameter | Mean | SD | Minimum | Maximum | p-value |
|-----------------------------|------|-----|---------|---------|---------|
| Coronal distance (mm) | GVS | 2.3 | 1.0 | 0.6 | 0.315 |
| | CS | 1.9 | 0.9 | 0.7 | |
| Apical distance (mm) | GVS | 2.5 | 1.1 | 0.5 | 0.438 |
| | CS | 2.2 | 1.0 | 0.8 | |
| Angular deviation (degrees) | GVS | 2.2 | 1.1 | 0.0 | 0.032* |
| | CS | 3.5 | 1.6 | 0.8 | |

GVS, guided virtual surgery; CS, conventional surgery.
* statistically significant (p≤0.05).

Table 2 – Data from the overlapping.

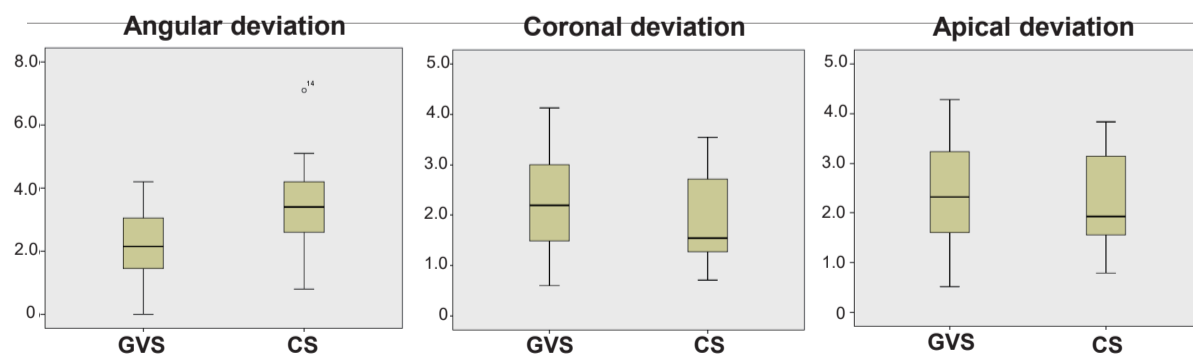


Figure 5 – Box plots showing (a) angular deviation (degrees), (b) coronal deviation (mm) and (c) apical deviation (mm) of the evaluated techniques.

Conclusion

It can be concluded that single-tooth implant placement by **GVS is more accurate**, at least for the angular deviation, when compared to CS with a surgical guide made by hand. Considering the linear deviations (cervical extremity and apical end), the difference between both groups cannot be demonstrated in this study.

Acknowledgements

