Title
A NOVEL DIGITAL WORKFLOW INTEGRATING NAVIGATION SURGERY AND CAD/CAM GUIDED PROSTHESIS FOR IMMEDIATE LOADING OF SINGLE IMPLANTS IN THE ESTHETIC ZONE: A 1 YEAR COHORT STUDY.

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Body
Background:
Nowadays both clinicians and patients have set more stringent benchmarks for implant success. Optimal implant positioning through a prosthetically driven decision-making is mandatory to achieve function and satisfactory aesthetics. Patients no longer expect only improved function when replacing missing teeth, but they also anticipate a natural-appearing, fixed provisional restoration that can be delivered immediately. Dynamic navigation/guidance is the use of a system that allows the surgeon to visualize implant site development while the drills are in function. Deviations from the predetermined plan can be seen in "real time" and changes to the plan can be made at the time of surgery.

Purpose:
To report a digital integrated workflow for immediate loading implants for single tooth gap in the esthetic zone in one visit using dynamic navigation surgery.

Materials and methods:
Patients referred for implant surgery and immediate loading to rehabilitate missing single tooth in the esthetic zone. A case study was executed, in which the file DICOM and the STL file of the digital impression were matched with the digital implant and the prosthetic rehabilitation. Implants were placed according to one-staged dynamic surgical navigated procedure (X-Guide) and loaded immediately. A total of 62 implants (Nobel Parallel - Nobel Biocare AG) were inserted with immediate load.
All implants were placed in maxillary and mandibular anterior and premolar teeth in healed sites and post extractive sockets. The digitally designed temporary shell with proximal wings was relined and fitted onto the abutment connected to the implant that was just placed by means of the dynamic navigation system. Among the implants placed, 14 (22.58%) were implanted in healed sites, of which 8 (57.14% of healed site) in regenerated bone, 48 (77.42%) were placed in post extractive sockets.

Results:
No patient dropped out of the study in the first year. One implant failed before the definitive prosthesis delivery, accounting for a cumulative success rate of 98,38%. No definitive prostheses failed. Marginal bone remodeling at 1 year was 0.63 ± 0.25 mm (the mean was the same for the mesial and distal zone). At the 1-year follow-up session (n=62), bleeding on probing was 10%, and the plaque index was 8%. All patients were successfully rehabilitated and had their definitive prostheses in function at the end of the 1-year post-loading follow-up.

Conlcusion:
Integrating these comprehensive clinical data into a 3D visualization of the implant recipient site characteristics and neighboring anatomy provides the clinician with better insight into the surgical, prosthetic, and esthetic treatment requirements and, as such, may improve decision-making, increasing the predictability of the overall implant treatment. The navigation surgery
navigated surgery was a tool that allowed the realization of a completely digital protocol and a direct and continuous control of surgical procedures.