Author’s response to reviews

Title: Complete-arch fixed reconstruction by means of guided surgery and immediate loading: a retrospective clinical study on 12 patients with 1 year of follow-up

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Author’s response to reviews:

Dear Editors and Reviewers,

enclosed you find the response to all your comments. We have also modified our text according to the new requirements. The modifications have been highlighted using different color (red / yellow).

We have also fixed the problems within the Declaration sections and we have further anonimized the pictures. Please consider, anyway, that we have the consent for publication, signed by our patients.

We truly hope the paper can be acceptable for publication now, after this third revision.

Thank You so much,
Herzlichen Dank,

Dr. Henriette Lerner

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Reviewer n° 1

General Comments:

The authors report a retrospective clinical study on complete-arch fixed implant rehabilitation by the use of guided surgery. The paper shows very interesting results and no flaws are detected in the statistical evaluation nor in the overall considerations, even if minor improvements may be applied.
----AUTHORS’ REPLY: THANK YOU.

Abstract:
Page 2:
-Line 38-39: "…for a 1-year implant survival rate…" I suggest "giving", "resulting in" or any synonyms instead of "for".
----AUTHORS’ REPLY: THE SENTENCE NOW READS: Only 2 implants failed to osseointegrate and had to be removed, in one patient, giving a 1-year implant survival rate of 98.2% (108/110 surviving implants);

-line 39-41: "8/12 prostheses that did not undergo any failure or complication during the entire follow-up period." Please consider removing "That".
----AUTHORS’ REPLY: THE SENTENCE NOW READS: Only 2 implants failed to osseointegrate and had to be removed, in one patient, giving a 1-year implant survival rate of 98.2% (108/110 surviving implants);

Introduction:
Page 3:
-Line 2-4: "… represent a predictable for the rehabilitation …" Please consider "… represent a predictable solution for the rehabilitation …"
----AUTHORS’ REPLY: THE SENTENCE NOW READS: The immediate functional loading of implant-supported, fixed full-arch prostheses can today represent a predictable solution for the rehabilitation of edentulous patients [1–3], even in the case of implant placement in fresh post-extraction sockets [4].

Page 5:
-Line 1-2: "allows one to obtain " please consider removing "one"
----AUTHORS’ REPLY: THE SENTENCE NOW READS: In particular, we aim to demonstrate how a correct planning of the 3D positioning of the implants allows to obtain complete-arch fixed rehabilitations with highly predictable aesthetics.
Methods:

Page 5:
- line 38: "Patients, that were followed up for at least 1 year" Please check spelling "least" instead of "leadt", "followed" instead of "fellowed"
--- AUTHORS’ REPLY: THE SENTENCE NOW READS: Patients, that were followed up for at least 1 year

- line 44: "Patients with other prosthetic rehabilitation than complete-arch fixed prostheses",
please consider "Patients with any other prosthetic rehabilitation rather than complete-arch fixed prostheses"
--- AUTHORS’ REPLY: THE SENTENCE NOW READS: Patients with any other prosthetic rehabilitation than complete-arch fixed prostheses without artificial gum

Page 6:
- Data acquisition, lines 32-36: "...in order to have all the .STL files available for the upload in the guided surgery software. All these models were saved as .STL files, ready to be imported in the guided surgery software". Repetition detected, please fix accordingly.
--- AUTHORS’ REPLY: THE SENTENCE NOW READS: Finally, the initial situation, the diagnostic wax-up (and therefore the ideal morphology of the teeth) and the situation after virtual extractions were then scanned with a desktop scanner (Deluxe®, Open Technologies srl, Brescia, Italy), in order to have all the .STL files available for upload in the guided surgery software (Fig. 2 D).

- lines 50-60 page 6: "Care was taken to try to engage the fixtures as much as possible in the residual bone, exceeding the apex of fresh extraction sockets at least 3–4 mm, by choosing appropriate implant sockets, ideally at a distance of 2–3 mm from the residual buccal bone walls, and at a proper inclination. Ideally the axis of the implants had to be in the center of the teeth, to achieve a perfect prosthetic plan " please motivate the mentioned measures in the discussion.
--- AUTHORS’ REPLY: THE SENTENCES NOW READ: In the present study, care was taken to plan the implants in the best position, depth, and inclination, in order to engage the fixtures as much as possible in the residual bone (exceeding the apex of fresh extraction sockets at least 3–4 mm) to maximize stability, and at a distance of 2–3 mm from the residual buccal bone walls, to avoid aesthetic problems. At the same time, however, the planning was prosthetically guided, with the axis of the implants that had to be, as much as possible, in the center of the teeth. The final planning was the result of a compromise between the residual amount of bone available, and the ideal prosthetic emergence profile. By means of these sentences added in the discussion, we have motivated all the decisions made during the planning.

Page 7:
- line 1: Please consider to change "screened" with "checked" or other synonyms
--- AUTHORS’ REPLY: THE SENTENCE NOW READS: After the planning was successfully completed and carefully controlled, the models of the situation were 3D printed in the laboratory with a desktop printer and the implant analogues were inserted in these models (Fig. 4 A, B).

- line 34: Please consider to change "with a Morse-taper indexed connection" with "with a Morse-taper hexed connection" same at line 54 "Morse-taper indexed connection"

The implants used in this study (Esthetic Line-EL®, C-Tech, Bologna, Italy) were conical, with a Morse-taper hexed connection and an acid-etched surface.

Further characteristics of these implants are a beveled shoulder, to facilitate bone growth in the case of subcrestal placement in post-extraction sockets; a Morse-taper hexed connection, to reduce screw loosening and micromovements of the abutment; and a concave aesthetic concept with platform switching, for better soft-tissue healing.

- "In the coronal portion, in fact, microgrooving is present, in order to soften and reduce forces transmitted to the cortical bone during insertion” please provide literature justification.

We have removed the portion that was not supported by the literature.

Page 8:
- "After this…” I suggest considering "After the digital planning…”

After the digital planning, the surgical template was positioned, the fit was carefully checked (Fig. 6 C), and the guided surgery started with the preparation of all implant sites, using drills of incremental diameter, and ended with the placement of all planned implants, through the guide (Fig. 6 D, E).

- "This fixed full-arch temporary was cemented and a panoramic radiograph was taken" you assessed that in few areas bone augmentation procedures and tissue managing was performed as well as fresh socket implants. How did you manage the risk for cement contamination in those sites? Was the panoramic an X-ray check also aimed at this? Was the cement radiopaque? Please point out.

Yes the radiographs were also used to check any undetected cement residual, in order to avoid any interference with the healing. The cement was radio-opaque. Anyway, a careful clinical control was performed.

In addiction, in the presented case it might seem that the prosthodontics is screw-retained with multi-unit intermediary abutments (Img. 7B,8A) despite what described in Methods/Surgical and Prosthetic Treatment. Please point out accordingly.

- "the same aforementined desktop scanner…” into "aforementioned"

These two impressions were sent to the dental laboratory, where plaster casts were poured and scanned with the same aforementioned desktop scanner. These models were then overlapped in a computer-assisted-
Results:
Page 13
-line 24: "(53 SCs, 17 BRs, and 2 fixed FAs)" Please disclose meanings for the acronyms in the Surgical and prosthetic treatment section page 8 and in abbreviation section page 20.
----AUTHORS’ REPLY: THE SENTENCE NOW READS: After six months of provisionalization, then, 72 fixed prosthetic restorations (53 single crowns, 17 bridges, and 2 fixed full arches) were delivered, in order to prosthetically reconstruct the complete arch.

Complications:
Page 14
-line 37-38: "…,but improved oral hygiene reduced the inflammation" please consider "…,but the improved oral hygiene reduced the inflammation"
----AUTHORS’ REPLY: THE SENTENCE NOW READS: Two patients had peri-implant mucosal inflammation with bleeding on probing around two post-extraction implants after 3 months, but the improved oral hygiene reduced the inflammation.

Conclusions:
Page 19
-line 42-43: "and good soft-tissue stability" please consider "and good soft-tissue stability"
----AUTHORS’ REPLY: THE SENTENCES NOW READ: After a provisionalization period of 6 months, 72 fixed zirconia-ceramic prosthetic restorations (53 single crowns, 17 bridges, and 2 fixed full arches) were delivered. The results showed a 1-year implant survival rate of 98.2% (108/110 surviving implants) and good soft-tissue stability.

Figure legends:
Page 32
-line 13-14 and line 31-32: "prosthetically driven matter" please consider more common expressions like "prosthetically driven position/philosophy/guidance…"
----AUTHORS’ REPLY: THE SENTENCES NOW READ: Once again, the implant position, inclination and depth were carefully planned, trying to engage the fixtures as much as possible into the bone, to increase primary implant stability, and taking into account the emergence profile and the overlying future prosthesis, so that implants were placed in a prosthetically driven position.

-line 33-34: "implant emergency profile" please consider "implant emergence profile"
----AUTHORS’ REPLY: THE SENTENCE NOW READS: (C, D) Visualization of the implant emergence profiles in relation to the ideal position of the teeth and the prosthetic plan, in the maxilla and mandible.
Reviewer n° 2

the title is pertinent, the abstract is pertinent so no modifications are requested here.  
----AUTHORS’ REPLY: THANK YOU.

the intro is extremely clear and written very well.  
----AUTHORS’ REPLY: THANK YOU.

in the methods, not necessary to report the ethics comittee approval immediately at the beginning, this short sub-heading is non useful here. you can move this information at the end of the patient selection chapter.  
----AUTHORS’ REPLY: WE HAVE MOVED THIS SENTENCE AT THE END OF THE PATIENT SELECTION CHAPTER AND WE HAVE ERASED THIS ONE BECAUSE NOT NEEDED.

in addition, although the methods are explained well, the data acquisition has not been performed with an intraoral scanner (why?) and therefore the workflow is partially analog and partially digital. today, it is possible to work in full digital and this is a major limit of this study that should be reported in the discussion session now. intraoral scanners are revolutionizing the dental world and guided surgery is affected too.  
----AUTHORS’ REPLY: WE HAVE INTRODUCED A SENTENCE IN OUR DISCUSSION SESSION IN ORDER TO CLARIFY THE WORKFLOW WAS NOT FULLY DIGITAL HERE, BUT DIGITAL-.ANALOGIC. HOWEVER, CASES LIKE THE ONES PRESENTED HERE CANNOT EASILY SOLVED BY MEANS OF A FULL ENTIRELY DIGITAL WORKFLOW, AND WITHOUT ANY ANALOGIC STEP. THIS SENTENCE READS: Moreover, this study was performed following a mixed, digital-analog workflow and this could be considered as another limitation of the present research, since the use of intraoral scanners is today well established [44] and could potentially reduce the number of steps and procedures described here.

moreover, the number of pictures is really too high and some of them are really unnecessary and not significant, for example figures 1g, 6d,6g and 6h, should be cancelled as well as fig. 11a because they do not mean nothing, the contribution of these figures is useless.  
----AUTHORS’ REPLY: WE HAVE ERASED ALL THE PICTURES CONSIDERED NOT NECESSARY. AS A CONSEQUENCE ALL THE FIGURES HAVE BEEN RENUMBERED IN THE TEXT AND IN THE UPLOADED FILES AND SOME LEGENDS HAVE BEEN REASED TOO.

i would finally prefere to have a longer follow-up but i understand that is not possible.  
----AUTHORS’ REPLY: WE AGREE A LONGER FOLLOW-UP WOULD BE PREFERRABLE BUT WE DO NOT HAVE IT NOW, SOON WE WILL HAVE IT AND WE WILL RECONSIDER ALL THE PARAMETERS.

about implant survival, i have experienced that it can be lower when implants are placed with guided surgery, because it is not easy to obtain the best primary stability. what the authors found here, looks promising, but how they successfully stabilize their implants?
AUTHORS’ REPLY: AS REPLIED TO REVIEWER N°1 TOO, CARE WAS TAKEN TO ENGAGE THE IMPLANTS IN THE SOCKETS FOR A MINIMUM OF 3-4 MM, THIS CAN GUARANTEE GOOD STABILITY RESULTS. THE FIXTURES USED WITH GUIDED SURGERY, IN PARTICULAR THE MACROTOPOGRAPHY AND THE DIMENSION OF THE THREADS PLAY A MAJOR ROLE IN THE SURVIVAL WITH GUIDED SURGERY.

finally, i do not like the term "procedural complications" i would rather use "immediate post-op complications" dealing with surgery and immediate provisional loading. i kindly ask the authors to correct.

----AUTHORS’ REPLY: WE USE THE TERM “IMMEDIATE OPERATIVE/ POST-OPERATIVE COMPlications, BECAUSE THE COMPLICATIONS THAT COULD OCCURR WERE ALSO INTRAOPERATIVE.

results are given in full and clear, tables are helpful even if the number of patients but not the implants is limited.

----AUTHORS’ REPLY: THANK YOU. UNFORTUNATELY WE CANNOT MULTIPLY THE NUMBER OF OUR PATIENTS.

the discussion considers the most important similar papers written in the present literature, i appreciate it.

----AUTHORS’ REPLY: THANK YOU.

i just would add as a limitation the fact that this workflow is partially digital and not entirely.

----AUTHORS’ REPLY: WE HAVE INTRODUCED A SENTENCE IN OUR DISCUSSION SESSION IN ORDER TO CLARIFY THE WORKFLOW WAS NOT FULLY DIGITAL HERE, BUT DIGITAL-ANALOGIC. HOWEVER, CASES LIKE THE ONES PRESENTED HERE CANNOT EASILY SOLVED BY MEANS OF A FULL ENTIRELY DIGITAL WORKFLOW, AND WITHOUT ANY ANALOGIC STEP. THIS SENTENCE READS: Moreover, this study was performed following a mixed, digital-analog workflow and this could be considered as another limitation of the present research, since the use of intraoral scanners is today well established [44] and could potentially reduce the number of steps and procedures described here.

in addition, more data are needed on the best implant position to have the possibility to draw specific conclusions and finally the perfect algorithm to define the best implant position for the best esthetic result, through guided surgery. the authors should be aware of it, and not presume too much from this short-term follow up study.

----AUTHORS’ REPLY: WE ARE AWARE OF THIS AND CLEARLY THERE IS NOW A NEED FOR MORE DATA, IN ORDER TO ESTABLISH THE BEST IMPLANT PLANNING POSITION IN GUIDED SURGERY, THE ONE THAT CAN GUARANTEE THE BEST LONG-TERM CLINICAL, AND AESTHETIC RESULTS. MORE STUDIES ARE NEEDED.