# Flapless immediate installation Astra Tech ST fixtures in the ant

*How early can we replace single teeth in the anterior maxilla with implants? How early can we load these implants? How can we achieve better esthetics, less discomfort and better economy at the same time?*

***Thomas Sefranek DDS***
*works in a small town in Northern Norway approximately 200 km north of the arctic circle. His dental clinic is mainly engaged in implant therapy. His patients are recruited or referred from the area between the Lofoten Islands in the west and the Swedish border in the east, up to four hours drive away. These long trips are one reason that the author is looking for simpler and more efficient solutions. Both surgical and prostodontic treatment of the presented in this article was performed by the author.*

*Address: Implantatklinikken, PO Box 24, N-8455 Stokmarknes.*
*E-mail: thomas.sefranek@tnett.no*

Today, many patients demand faster solutions and better esthetics for their new single teeth than a decade ago. Healthy adjacent teeth are more common than before – who these days wants to sacrifice healthy tooth substance to make a traditional bridge? The benefit of removable or temporary solutions are often outweighed by their disadvantages. Elderly people retain their own teeth longer than in previous generations, many of them having well-functioning crowns on their front teeth which need not be incorporated into a new bridge just because one tooth needs removal. Can we help these patients in a faster and more comfortable way than before?

In single tooth cases of good bone quality and quantity, the author has often wondered whether a flap had to be raised at all. After precise preoperative diagnosis and treatment planning, it should be easy for the experienced surgeon to navigate in the anterior maxilla without raising a flap. If in doubt, the mucosa could if necessary be lifted up during the operation.

These considerations led us to the decision to install and load single implants in the esthetic zone without rising a flap, whenever it was possible and secure. A two two years prospective study was thus initiated: Immediate installation and functional loading of Astra Tech ST fixtures in the anterior maxilla.

## Summary

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The purpose of our study was to consider two main theses:
1. Given good or excellent primary stability, immediately installed and loaded Astra Tech ST fixtures show predictable, equal osseointegration and equal or better stability of crestal bone level than the standard protocol.
2. The flapless technique gives better esthetic results in the soft tissue than the traditional muco-gingival flap.
In this article we describe the results of the flapless test group which was not randomized in advance. On the contrary, the patients were informed about the possibility that a flap or even the six months standard protocol could be necessary. To anticipate one conclusion, it must be mentioned that the range of indication turned out to be much narrower than planned. Only 10 of 60 cases fitted the criteria. This reduction was the result of the surgeon's considerations during the operation.

These criteria were used:
- mature bone after former extraction or acute fracture of crown/root
- poor prognosis for other treatment
- no acute infection or cysts
- minor apical defects were accepted
- no mucosa or bone damage due to traumatic extraction of tooth or root fragment
- sufficient surrounding bone to install a 13mm implant or longer in a good position
- good or excellent primary stability
- gap between post extraction alveolar socket and fixture less than 1.5 mm
- informed consent according to the Helsinki declaration
- no smoking for one week
- no general medical contra indications.

## Surgical procedure

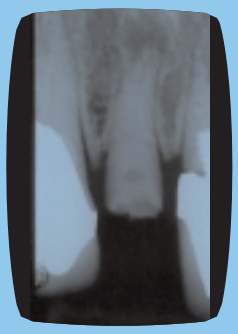
In extraction cases, we used a periotome for gently cutting of the periodontal ligament. The luxation and extraction was performed as carefully as possible and could take longer than the insertion of the implant itself!

In mature bone, a 5 mm diameter punch was used to remove the crestal mucosa, sparing the papillae.

The gingival height was measured by probing the distance between the buccal marginal bone level and the buccal gingival margin. The direction and orientation of the ST fixture was decided according to the anatomic conditions present. The alveola was carefully prolonged in an apical direction in order to obtain at least 13 mm for incisors and laterals. Premolars were also drilled up to 15 or 17 mm. Countersinking was performed only if necessary, and then with great care. Preservation of the buccal bone lamella was very important.

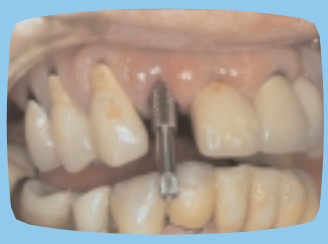
On completion of drilling procedures, it was sometimes difficult to inspect the implant site and to decide the length of the fixture. To make sure

1. Acute horizontal fracture av 12; poor prognosis for traditional crown restauration. Well-functioning crowns on adjacent teeth.



2. Radiograph showing minor chronical apical periodontitis. Sufficient surroundingbone.

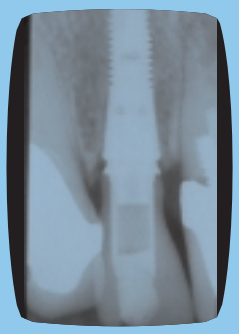
3. Careful extraction and flapless installation of a ST 4, 5mm fixture.



4. Impression.

5. To avoid contamination of the implant site by impression material, it is recommanded to use a stent for the impression on fixture level. The stent is later put back into the master model, which was made before the installation.

6. Chairside temporary crown in Luxatemp® on the ST Temporary Abutment.

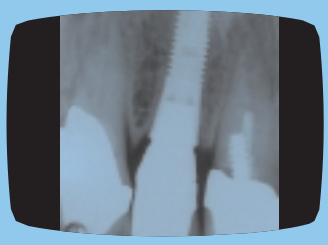


7. Radiograph immediately after installation of the chairside temporary crown.

8. Laboratory-made Sinfony® crown. No occlusal contacts.

9. Six months after installation of the Astra Tech ST fixture a ceramic Empress® crown was cemented on a Cast-to-Abutment. No scare tissue and intact papillae.

10. Palatinal view showing nice gingival adaption.



11. Radiograph six months after installation. No significant change of the crestal margin.

12. Situation ca. six weeks after extraction 25 due to vertical root fracture.

13. Removal of the crestal gingiva by 5 mm diameter punch.

14. After removal of the initial epithel layer and keeping the papillae, the osseoinductive tissue is left in the alveola.

15. During preparation of the fixture site, a direction indicator might be useful, like shown in this similar case.

that the ST fixture was submerged correctly and for the purpose of easier navigation, we used a fixture mount with a home-made millimeter scale.

It was thus possible to submerge all fixtures to the buccal bone level. In cases of preserved interdental septa, good biological width and high esthetic demands, the ST fixture was submerged midway between the buccal and the approximal bone level, thus preserving the support of the papillae.

Icepack for one hour, 1200 mg Ibuprofen and 2 gr Apocillin one hour preoperative and for the following three days were prescribed.

**Prosthodontic procedures:**

An impression on the fixture level was made immediately after the installation, using a prefabricated stent. In critical situations a temporary crown was made immediately in Luxatemp® or composite. A laboratory made temporary crown in Sinfony®-composite was placed within a few days, using the Astra Tech ST Temporary Abutment.

It was important not to damage the gingival tissue in order to avoid gingival recession. The temporary crown was well adapted, contoured and screw retained, using a torque of ca. 10 ncm. There were no occlusal or articulation contacts and the patients were asked to “eat pasta” for the next four weeks. After six months, a traditional ceramic or metal-ceramic crown was made on the base of Cast-to or Profile Bi Abutment.

The Sinfony® crowns were so nice, that it could be difficult to explain for the patient, why they had to be replaced. For a couple of elderly patients, we decided to keep the temporary Sinfony® crowns and not to replace them. The situation

approximately two years later is still very satisfying.

The postoperative period for all the patients was reportedly without any pain or discomfort. Nearly all patients reported no need for additional analgesics.

## Conclusion

According to the author's opinion, the flapless technique keeps the papillae and gives better esthetics compared to the standard flap. It has a very good cost/benefit ratio, is time saving and thus lowers the treatment costs. Following certain criteria, a very high success rate can be expected. On this analysis, only a limited number of cases seem suitable for flapless treatment.

Given good primary stability, no difference in osseointegration could be seen compared to the standard protocol in this limited pilot study. Radiographic examination indicated that the marginal bone level was similar, if not even better than in the standard protocol. Only one fixture in 60 was lost, and this was successfully replaced after six months using the standard protocol.

It seems that the best sites for this flapless technique in immediate cases are lateral incisors or minor premolars due to smaller root diameter. It is also the author's impression that these teeth are more common as acute implant candidates, as a result of failed endodontics, root fractures or similar.

The immediate flapless installation and loading technique seems to have numerous advantages but is limited to a narrow range of indications and patients.

Given the small number of cases in this study, more research has to be done.


## Acknowledgement

The author thanks Astra Tech AB Mölndal, Sweden for kind support and assistance. The crowns were made Bodø Dental Laboratorium, Bodø, Norway.


*Referenc*

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16. Impression.

17. It is recommanded to use a stent by e.g. TRIAD GEL®, for the impression on fixture level.

18. The occlusal surface of the temporary crown should be shaped like a canine in order to reduce occlusal forces.

19. The temporary laboratory-made Sinfony® crown on the ST temporary abutment three days after operation. After nearly two years it is as nice as on the first day.