

## Er:YAG Lasers for Autologous Bone Grafting vs Allograft Techniques

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## Hard- and Soft-Tissue Management Around Broken Teeth

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### SUMMARY

In this lecture are presented two cases from the author's implant practice, showing opposite results, with PRF autologous graft used in the first case and bovine bone graft failure correction used in the second. A minimally invasive approach with tunnel sub-periosteal preparation for bone augmentation provides predictable results in different oral bone parts, minimizing the recovery period and post-operative complications. Under tunnel preparation through small cuts the bone surface is activated to receive the PRF graft using Er:YAG laser with a chisel tip at MSP mode 20 Hz / 200 mJ. The period between extraction and implant placement is 7 months, during which the grafting procedure is performed twice.

A new approach to apical surgery is demonstrated with the second case. A late occurring (six months after successful implantation and loading), bone resorption around the implant top is evident clinically and on X-ray. After analysis we realized that the problem was poor integration of the bovine bone graft, performed a year prior to implantation. The cortical zone showed hard and integrated allograft, so the implants were placed. But the cancellous quality of bone was not that nice, and during the operation particles of bovine bone were present. To be more sure in the cleaning behind the implant apex, we decided to work with Er:YAG laser with a conical tip on sub-ablative settings of SSP 50 Hz / 40 mJ, imparting hydro shock waves to the saline solution, thus causing surface cleaning. Under 3.5 magnification, the wound was evaluated and defined as clean. Soft-tissue particles were collected - mainly granulation tissue but also loosen small bone particles were present.

The cases shown are:

- Sub-periosteal cortical stimulation with autogenous graft PRF
- Apical surgery with root/implant preservation.

### SUMMARY

Fractured walls or even whole tooth crowns are quite common in cases of root canal treated teeth with large fillings. Rebuilding supragingival fracture is not a problem, but fractures located subgingivally or below bone level often means that we qualify the tooth for extraction. In the elderly, any extraction is still reasonably well accepted. While in younger patients (20 - 30 years) extraction often is not acceptable. A similar situation exists with deep subgingival decay descending to the bone level, in which it's impossible make proper conservative restoration and / or root canal treatment due to the lack of dryness or isolation. The use of a laser as an alternative to extraction has not encountered negative feedback from the patient. As a minimally traumatic tool for shaping gums and bone, the laser is an ideal tool for younger patients - when extraction will cause loss of alveolar bone or will be associated with expensive regenerative treatments and implantation. Also implantation over a longer period of time is associated with the risk of bone loss around the implant, with mucositis and peri-implantitis. Controlled "loss" of bones and gums with the laser use is always safer than uncontrolled bone loss, even with minimally traumatic extraction. The doctor's workload is relatively small and the risk associated with possible complications is practically zero in comparison to the socket preservation and implantation. This involves compromise and a dilemma. How mucosa and bones can be or should be removed? Will it still be possible to make a proper restoration after this surgery? How to reduce the size of the tooth to achieve longevity? How long will the tooth remain?

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