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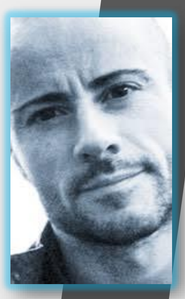


Vertical bone augmentation with GBR Pocket technique: Review of Literature

Scavia S*., Roncucci R., Maddalone M., Oliveira A.

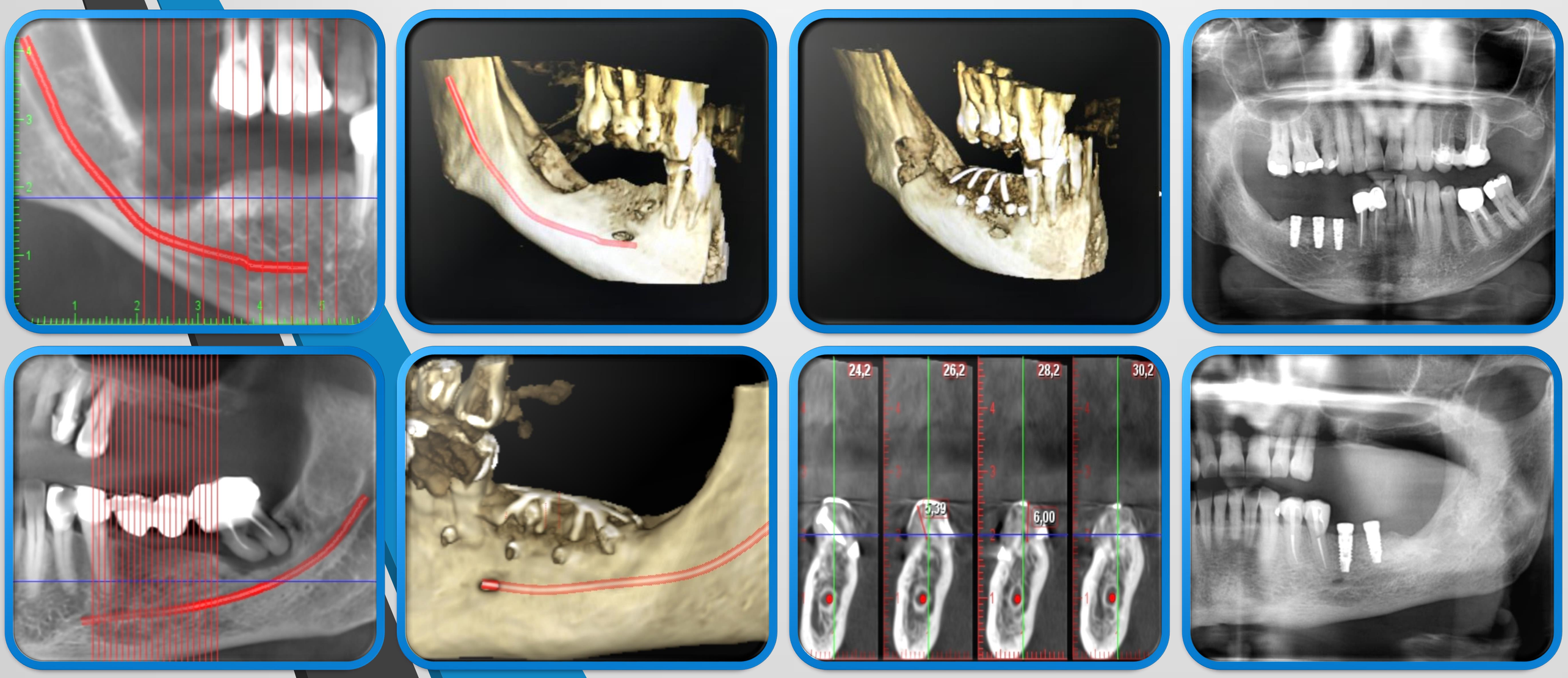
* stefano.scavia@fastwebnet.it - University of Milan Bicocca, Italy

The aim of this work is to compare the clinical outcomes of GBR Pocket Technique one site tunneling with the results reported from literature of vertical bone augmentation and crestal bone remodeling after one year follow-up. 4 international papers have been rated through the analysys of vertical GBR performed with a traditional flap in atrophic mandibular sites of edentoulous patients. Papers were considered between 2009 and 2019, a graft of autologous particulated bone in combination with DBBM was covered by a PTFE membrane with at least 6 months of healing time before implant placement. The measurement were made on CBTC pre and post surgery (see Case 1 and 2). The results and comparisons are shown in table 1.

Study	Ronda M et al	Urban I. et al	Simion M et al	Urban I. et al	Scavia S. et al (data on file)
Year	2009	2009	2007	2019	2019
Design of study	Randomized Controlled Trial	Retrospective Study	Perspective Study	Meta-analysis	Case Series
Type of graft	50% Autograft + 50% Allograft	Autograft	50% Autograft + 50% Allograft	Not specified	50% Autograft + 50% Allograft
Type of membrane	e-PTFE/d-PTFE	e-PTFE	e-PTFE	e-PTFE/d-PTFE	d-PTFE
Healing time of graft	6 months	6-9 months	average 27 weeks	Not specified	6-9 months
Vertical augmentation achieved after graft healing	4,91mm ± SD 1,78 (e-PTFE); 5,49mm ± SD 1,58 (d-PTFE) -> *P*=NS	5,5 mm ± SD 2,29	3,15 mm ± SD 1,12	4,42 mm (CI 3,97-4,87)	8,78 mm ± SD 2,39
Mean crestal bone remodeling		1,01 mm ± SD 0,57 after 1 year			0,59 SD ± SD 0,29
Complications/morbidity	Minor vascular complications (edema and hematoma) and 3 neurological complications (temporary paresthesia)		1 membrane exposure in one site after 3 months	PTFE showed 6,9%, rate of complication. The most common complication is membrane and graft exposure.	1 partially membrane exposure (2-3mm) after 4 months in one site and 2 cases of subgengival infection after 5 and 7 months (both resolved)
NOTES	Only mandibular sites (26) were considered		Only mandibular sites (10) were considered	13 cases with PTFE membranes were considered	32 cases on 28 patients on atrophic posterior mandibulae

Table 1: The table shows the results of the use of the GBR Pocket Technique (Scavia et al., 2019) in GBR vertical bone augmentation. In particular, the vertical bone augmentation after surgery and the mean crestal bone remodeling after 12 months from implants placement show encouraging results.

A bone graft with the use of GBR Pocket Technique was performed out of 32 cases in 28 different patients, the average bone augmentation after surgery seems to be alligned, or even better, than the average reported in literaure. Also the mean crestal remodeling after one year and the rate of complications are in line with the other studies taken into consideration. The surgical ratio of the GBR Pocket Technique is the use of a minimal-invasive surgical wound to reduce patient morbidity and compliance. A one-site tunneling technique allows bone harvesting throught the use of a cylindrical scraper in the same area of graft, and a better preservation of the mucous tissue anatomy (due to absence of a crestal incision and flap repositioning) achieves a better first intention healing. In fact the biological ratio of the GBR Pocket Technique is to preserve blood circulation (avoiding the distal relief incision), the anatomic preservation of residue keratinized tissue, the reduction of the oral fornix lost and a better respect of biomechanical properties of the flap. These features seem to explain the good results obtained.



Case 1 and 2: These cases show radiographical evaluations pre and post GBR pocket technique surgery: a huge bone augmentation allowed to place implants at 6-9 months after surgery in severe atrophic mandibulae.

In conclusion a vertical bone augmentation of 8,78mm ± SD 2,39 and a bone remodelling after 1 year of 0,59mm ± SD 0,29 was achieved on 32 cases with GBR Pocket Technique. Despite the encouraging initial results, a larger number of cases, further measurements and a longer follow-up should be taken into consideration to long term evaluation of this technique.