

УДК 617.528-089.819.843

## RESONANCE FREQUENCY ASSESSMENT OF IMPLANT PLACEMENT WITH POROUS TITANIUM GRANULES USED IN SINGLE STAGE SINE-LIFT PROCEDURE

Kiki Firas

EstetDent Clinic &amp; FiraDent Education Center (35 Talalikhina St. Moscow 109316 Russian Federation)

**Keywords:** titanium granules, autogenous bone, dental implants.

Titanium granules have been used within the field of orthopedic surgery for 20 or so years [1]. Recently, titanium granules, were introduced on the market as a non-resorbable grafting material for bone repair within the field of oral and maxillofacial surgery [2]. So far many research data have been published on the clinical outcome from procedures such as ridge-augmentation surgery, osseous defect, reconstructions after extensive cystectomies and in direct sinus-lift procedures. The main objective of this clinical study was to evaluate if this titanium granules is suitable for use as graft material first, and second to evaluate the resonance frequency assessment (RFA) of implant placement with the single stage sinus lifting procedure.

**Materials and methods.** 18 OsseoSpeed implants (Astra Tech) were placed to 9 patients with two or one stage sinus lift operation using a titanium granules in the experimental team, and autogenous bone in the control team. After placing all the implants in two teams ISQ (Ostell) units measured and scores noted. After 2–4–6 months (before loading) scores noted and compared with the first scores.

Insufficient bone volume in the posterior maxilla has been a challenge for the implant team ever since implantology has become a routine clinical method. Grafting with autogenous bone has been a gold standard due to lack of immunological rejection mechanisms and its osteoinductive and osteoconductive properties. Still using autogenous bone means harvesting procedure and requires additional surgery at the donor site, which may lead to postoperative morbidity. Therefore, several grafting materials used to avoid the graft-harvesting operation, they are more or less resorbable, although resorbing very slowly. The titanium granules is absolutely resistant to resorption and has a good clotting properties especially for reconstruction in different defects sizes. 9 patients (3 man, 6 women), non smokers, mean age 47 to 61 (av: 54), with atrophy of the maxillary alveolar ridge, diagnosed by panoramic and CT, the dental implants used, in all cases, OsseoSpeed (Astra Tech AB, Molndal, Sweden). The augmentation material divide our patients in two teams, the test team grafted with titanium granules, the control team with autogenous bone. A total of 18 implants were installed. All sinuses had less than 6 mm (2–5 mm) subantral alveolar bone vertically. The sinus area was prepared under local anesthesia. An incision was made on top of the alveolar crest with vertical releasing incisions. For 3 patients done the both left and right sinuses. A mucoperiosteal flap was reflected to expose the lateral wall of the maxillary sinus, and a bony window was outlined with a round bur. The window was left attached to the sinus

mucosa, which carefully elevated from the floor of the sinus. For the test & control team, with two windows (left and right sinuses). Autogenous bone grafted into the right window, and titanium granules into the left sinus. When the implants fixtures were installed in the same procedure, ISQ measured and score noted. The patients were given 1 g Penicillin 1 hour before the operation and then three times per day for 7 days. The abutment operation was performed 6 month later and ISQ units measured all the installed implants for the two teams.

**Results.** All implant areas were healed successfully. ISQ units scored 50 to 67 (av: 59) after the one stage sinus lift operation in the both teams, and 62 to 75 (av: 69) after 6 month of healing, which is similar to what is expected for implants in non grafted sites of maxilla. Still the use of the titanium granules in a one stage technique shows 63 to 71 ISQ (av: 67) score in the time of implant installation, but we didn't see any different on the time of loading.

**Discussion.** RFA assessment can be useful in implant dentistry during the operation and after healing prior loading, ISQ units (Ostell) give an idea about the bone formation from the grafted area and may be a reliable biomechanical technique that can monitor the osseointegration. Grafting materials such titanium granules, could be useful in case of poor primary stability for implants inserted during a one stage sinus lift procedure.

### References

1. Busted H., Rasmusson L. Porous titanium granules used as osteoconductive material for sinus floor augmentation: a clinical pilot study // *Clinical Implant Dentistry and Related Research*. 2009. Vol. 11, No. 2. P. 101–105.
2. Turner T.M., Urban R.M., Hall D.J., Andersson G.B. Bone ingrowth through porous titanium granulate around a femoral stem // *Ups. J. Med. Sci*. 2007. Vol. 112, No. 2. P. 191–197.

Поступила в редакцию 26.09.2012.

### ЧАСТОТНО-РЕЗОНАНСНЫЙ АНАЛИЗ УСТАНОВКИ ИМПЛАНТАТОВ ИЗ ПОРИСТОГО ТИТАНА ПРИ ОДНОМОМЕНТНОМ СИНУС-ЛИФТИНГЕ

Кики Фирас

Стоматологическая клиника «Эстет Дент»  
(109316, г. Москва, ул. Талалихина, 35)

С недавнего времени титановые гранулы используются как замещающий материал в орорональной хирургии. С применением частотно-резонансного анализа в срок 2, 4 и 6 месяцев оценены результаты установки 18 имплантатов OsseoSpeed (Astra Tech) 9 пациентам в возрасте от 47 лет до 61 года во время синус-лифтинга с использованием титановых гранул и аутокости. Все имплантаты прижились, и качество синус-лифтинга с применением пористого титана не уступало таковому при использовании аутокости.

**Ключевые слова:** титановые гранулы, аутокость, дентальная имплантация.