

Posterior Superior Alveolar Artery – Possible Complication Risk for Dental Implantology

*Liene Zamure^{1,2}, Laura Neimane¹, Andrejs Skaģers³,
Zanda Bokvalde¹*

Rīga Stradiņš University, Latvia

¹Department of Conservative Dentistry and Oral Health

²Department of Doctoral Studies

³Department of Oral and Maxillofacial Surgery

Introduction. Maxillary sinus floor elevation is a reliable way to enrich and increase the volume of the bone for successful dental implant placement, but this surgery as any other is another surgical intervention for a patient, and the patient has to consider the possible complications during such procedure.

Hemorrhage during the sinus elevation surgery is the third most common complication perioperatively after local wound dehiscence and perforation of Schneiderian membrane, but perforation of the Schneiderian membrane can occur because of the impaired vision due to intensive hemorrhage after damaging the vessel.

Aim, Materials and Methods. From January 2008 until March 2011, 108 patients underwent dental implantation procedure in RSU Institute of Stomatology with a CBCT examination done prior the surgery but after the bone augmentation if performed. In 108 patients, 216 maxillary sinuses were examined by single examiner. All the scans used for this study were done with I-CAT Next Generation, Imaging Science, USA. Images were taken with voxel size of 0.3 mm. The scans were examined in the frontal, sagittal and axial planes. If the PSAA was detected, the diameter of PSAA was measured in millimeters and data was divided into groups with diameter below and above 1.5 mm.

Results. In most of the CBCT images analysed (50.48%) PSAA was detected.

Patients were divided into groups before and after implantation. PSAA was detected in both groups almost equally. The PSAA was detected in both sides respectively 41.84% and 44.83% of the cases, and was not detected in 45.92% and 41.38% of the cases. The results were not statistically significant ($p > 0.05$).

For the patients whom PSAA was detected, its diameter was measured. For most of the patients (79.25%), the diameter of artery was below 1.5 mm.

In total, 11 patients with the PSAA diameter above 1.5 mm were detected. From these patients seven (63.64%) were females and four (36.36%) were male. The difference is not statistically significant ($p = 0.54$).

Since the mean age of patients who had the CBCT was 46.55 ± 9.68 (interval 17–65 years), patients were distributed in groups above and below the average age. From 11 patients whom the PSAA with diameter above 1.5 mm was detected, eight (72.73%) were older than the average age of patient and three (27.27%) were younger than the average age of patient. The difference is not statistically significant ($p = 0.23$).

Conclusion. Comparing the results with other authors, the research shows different tendencies in research tactics, but one thing most authors agree and refer to is the blood vessel trauma which can present a theoretical potential for significant bleeding during sinus floor elevation surgery and that could lead to obscuration of eyesight which could result in perforation of Schneiderian membrane and that is the most common complication during sinus floor elevation surgery.

Precise examination of CBCT and knowledge of maxillary blood supply is the key to avoid unnecessary bleeding during the sinus floor augmentation procedure and / or dental implantation that will lead to better treatment results, avoiding complications that results in reducing time of surgery and patients' comfort and expenses.