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Original Article

Comparative Evaluations Of Direct And Indirect Sinus Lift Technique In Patients Requiring Dental Implants

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ABSTRACT

Background: Dental implants are used to replace both the form and the function of missing teeth. The present study was conducted to compare direct with indirect sinus lift technique for insertion of dental implant. **Materials & Methods:** The present study was conducted on 28 patients requiring dental implant in posterior maxillary region. Patients were divided into 2 groups of 14 each. In Group I direct sinus lift procedure was performed while in group II, indirect sinus lift procedure was performed. In all patients, pain, gingival inflammation and swelling was assessed at 1st week, 3rd week, 6th week and at 2 months after implant insertion. **Results:** At 1st week, 12 patients in group I and 10 in group II had pain. At 3rd week, 11 patients in group I and 6 patients in group II had pain. At 6th week, 6 patients in group I and 2 in group II had pain. At 2 months, 2 patients in group I had pain. The difference was significant ($P < 0.05$). At 1st week, 70% in group I and 65% in group II had gingival inflammation, at 3rd weeks, 42% and 38% had inflammation in group I and group II respectively. At 6th weeks, 25% and 28% had inflammation in group I and group II respectively whereas at 2 months, 8% and 5% had inflammation in group I and group II respectively. The difference was non-significant ($P > 0.05$). At 1st week, 68% in group I and 60% in group II had swelling, at 3rd weeks, 35% and 26% had swelling in group I and group II respectively. At 6th weeks, 22% and 12% had swelling in group I and group II respectively whereas at 2 months, 5% and 2% had swelling in group I and group II respectively. The difference was non-significant ($P > 0.05$). **Conclusion:** Authors found that osteotome technique can be recommended when more than 6 mm of residual bone height is present and an increase of 3-4 mm is expected. In case of more advanced resorption direct method through lateral antrotomy has to be performed.

Key words: Lateral antrotomy, Osteotome, Subantral class

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INTRODUCTION

Dental implants are used to replace both the form and the function of missing teeth. In case of maxillary posterior region, the placement of dental implant needs careful evaluation of maxillary sinus. The actual dental implant is a metal screw designed to thread into the jawbone and allow for the attachment of a variety of prosthetic dental replacements. The implant is made of medical grade titanium or a titanium alloy.¹

Titanium is used due to its excellent compatibility with human biology. There should be sufficient bone in the maxillary and mandibular ridge to support these implants. Anatomic limitations often associated with the posterior maxilla are flat palatal vault, deficient alveolar height, inadequate posterior alveolus, increased pneumatization of the maxillary sinus, and close approximation of the sinus to crestal bone. Maxillary bone, primarily medullary and trabecular, has less quantity and bone density than the premaxilla or mandible. Adjacent cortices of compact bone are generally very thin, providing minimal strength.² In cases of insufficient bone height, a lateral window technique and an osteotome sinus floor

elevation technique and placing bone-graft material in the maxillary sinus to increase the height and width of the available bone is considered best option. Experience in the rehabilitation of severely resorbed maxilla is growing. Autogenic bone graft are used most often. The bone seems to be harvested from the iliac crest most often, although several anatomic areas have been used.³ The present study was conducted to compare direct with indirect sinus lift technique for insertion of dental implant.

MATERIALS & METHODS

The present study was conducted in the Dept. Of Dentistry of the Institute. Patna, Bihar India. It comprised of 28 patients requiring dental implant in posterior maxillary region having insufficient bone height was considered. Smokers, Pregnant women and patients with chronic sinusitis were excluded from the study. All were informed regarding the study and written consent was obtained. Ethical clearance was taken prior to the study. General information such as name, age, gender etc. was recorded.

Maxillary sinus was evaluated carefully using PNS sinus view. Misch⁴ subantral classification of maxillary sinus was used. SAC 1 was 10- 12 mm residual alveolar ridge. SAC 2 was 10- 12 mm residual alveolar ridge. SAC 3 was 5-10 mm residual alveolar ridge and SAC 4 was < 5mm residual alveolar ridge.

Patients were divided into 2 groups of 14 each. In Group I direct sinus lift procedure was performed while in group II, indirect sinus lift procedure was performed. Postoperatively Cap. Amoxycylav 625 mg was continued along with Tab. Metronidazole 400 mg thrice a day, a combination of Tab. aceclofenac 100 mg and Tab. paracetamol 500 mg for 5 days in all group A and group B patients. In all patients, pain, gingival inflammation and swelling was assessed at 1st week, 3rd week, 6th week and at 2 months after implant insertion. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

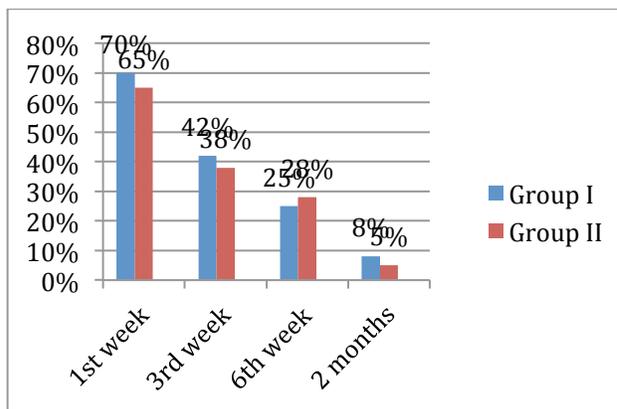
RESULTS

Table I shows that at 1st week, 12 patients in group I and 10 in group II had pain. At 3rd week, 11 patients in group I and 6 patients in group II had pain. At 6th week, 6 patients in group I and 2 in group II had pain. At 2 months, 2 patients in group I had pain. The difference was significant (P< 0.05). Graph I shows that at 1st week, 70% in group I and 65% in group II had gingival inflammation, at 3rd weeks, 42% and 38% had inflammation in group I and group II respectively. At 6th weeks, 25% and 28% had inflammation in group I and group II respectively whereas at 2 months, 8% and 5% had inflammation in group I and group II respectively. The difference was non- significant (P> 0.05). Graph II shows that at 1st week, 68% in group I and 60% in group II had swelling, at 3rd weeks, 35% and 26% had swelling in group I and group II respectively. At 6th weeks, 22% and 12% had swelling in group I and group II respectively whereas at 2 months, 5% and 2% had swelling in group I and group II respectively. The difference was non- significant (P> 0.05).

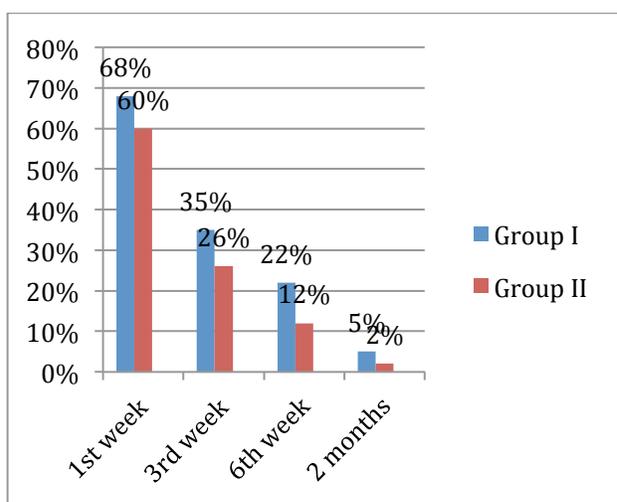
Table I Comparison of pain in both groups

VAS	Group I	Group II	P value
1 st week	12	10	0.01
3 rd week	11	6	
6 th week	6	2	
2 months	2	0	

Graph I Gingival inflammation in both groups



Graph II Swelling in both groups



DISCUSSION

While there may be a number of reasons for achieving a greater volume of bone in the posterior maxilla, the most common reason in contemporary dental treatment planning is to prepare the site for the future placement of dental implants. Sinus augmentation (sinus lift) is performed when the floor of the sinus is too close to an area where dental implants are to be placed. This procedure is performed to ensure a secure place for the implants while protecting the sinus. Lowering of the sinus can be caused by long-term tooth loss without the required treatment, periodontal disease and trauma.⁵ Patients who have the following may be good candidates for sinus augmentation such as lost more than one tooth in the posterior maxilla, lost a significant amount of bone in the posterior maxilla, missing teeth due to genetics or birth defect, minus most of the maxillary teeth and need a strong sinus floor for multiple implants.⁶ Lateral window technique is direct technique in which the procedure is performed from inside the patient’s mouth where the surgeon makes an incision into the gum, or gingiva. Once the incision is made, the surgeon then pulls back the gum tissue, exposing the lateral bony wall of the sinus. The surgeon then cuts a

"window" to the sinus, which is exposing the Schneiderian membrane. The membrane is separated from the bone, and bone graft material is placed into the newly created space.⁷ The gums are then sutured close and the graft is left to heal for 4–12 months. The graft material used can be either an autograft, an allograft, a xenograft, an alloplast, synthetic variants, or combinations thereof. Studies indicate that the mere lifting of the sinus membrane, creation of a void space and blood clot formation might result in new bone owing to the principles of guided bone regeneration. The long-term prognosis for the technique is estimated to 94%. It is not known if using sinus lift techniques is more successful than using short implants for reducing the number of artificial teeth or dental implant failures up to a year after teeth/implant placement.⁸

Indirect or osteotome technique is normally performed when the sinus floor needs to be lifted less than 4 mm. The osteotome technique is performed by flapping back gum tissue and making a socket in the bone within 1–2 mm short of the sinus membrane. The floor of the sinus is then lifted by tapping the sinus floor with the use of osteotomes. The amount of augmentation achieved with the osteotome technique is usually less than what can be achieved with the lateral window technique. A dental implant is normally placed in the socket formed at the time of the sinus lift procedure and left to integrate with bone. Bone integration normally lasts 4 to 8 months. The goal of this procedure is to stimulate bone growth and form a thicker sinus floor, in order to support dental implants for teeth replacement.⁹

In present study we compared pain, inflammation and swelling in both groups. We observed that there was less number of patients who had pain in group I as compared to group II. Similarly the inflammation and swelling was comparatively less in group I but the difference was non-significant ($P > 0.05$).

Pal et al¹⁰ in their study found that the gain in bone height was significantly greater in direct procedure through lateral antrostomy (mean 8.5 mm) than in indirect method through crestal approach by osteotome technique (mean 4.4 mm).

CONCLUSION

Authors found that osteotome technique can be recommended when more than 6 mm of residual bone height is present and an increase of 3-4 mm is expected. In case of more advanced resorption direct method through lateral antrostomy has to be performed.

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