Case Report

Pain Perception following Implant Placement with and without Flap Reflection Technique

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ABSTRACT

The aim of this case series was to compare pain following implant placement with-flap and flapless technique. The patient evaluated the pain on a 10-cm visual analog scale (VAS) ranging from 0 (no pain) to 10 (maximum pain possible). The series comprised of 10 patients aged from 20 to 60 years in which 20 implants were placed. It was observed that the pain felt by patient postoperatively measured on visual analogue scale was lesser for those placed through the flapless as compared to those which were placed with flap technique , which was statistically significant ($p<0.05$). The results showed a significant difference in pain measurements, with higher scores on the VAS with-flap surgery and less pain with the flapless procedure. It can be concluded that with the flapless procedure, patients experienced pain less intensely and for shorter periods of time as compared with flap procedure.

Keywords: Dental implants, delayed loading, flapless surgery, visual analog scale.

INTRODUCTION

Implant dentistry is rapidly evolving, and nowadays, considerable emphasis is being placed on predictable treatment planning with maximum patient comfort and minimal patient morbidity. In recent years, flapless implant surgery has become a popular treatment protocol for dental implant placement.[1] This technique involves removing a small amount of tissue over the crest of the edentulous ridge, just sufficient to expose the underlying bone to facilitate implant placement. As a consequence, no sutures are required, and no soft tissue flap is reflected, potentially reducing post-operative discomfort and swelling.[2] The advantages of flapless implant surgery include less traumatic surgery; decreased operative time, rapid postsurgical healing, fewer postoperative complications and increased patient comfort. Some studies even suggest that with flapless implant surgery, patients' postoperative discomfort such as swelling and pain is almost negligible.[3] Studies including patient outcome variables comparing flapless implant protocols with conventional flap procedures are lacking. Conventional flap-raising procedures are considered uncomfortable for patients and minimally invasive procedures are designed to maximize patient comfort by avoiding traumatic injury to the tissues. Flapless insertion of dental implants prevents complications arising from soft-tissue elevation such as infection, dehiscence and necrosis, and provides dental implant success rates equal to conventional techniques.[4] Present case series intended to evaluate pain perception following implant placement "with-flap" and "flapless" technique.

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CASE SERIES

This case series compared the pain following implant placement with-flap and flapless technique and comprised of 10 patients aged from 20 to 60 years in which 20 implants were placed. For a satisfactory treatment outcome, pain after implant placement is of concern for both the dentist and the patient. Implant placement is known to be a mild to moderately painful procedure. However, the perception of pain varies among individuals because it is a multifaceted emotional and sensory experience that is associated and exaggerated with previous experience, expected stress, clinical situation, and anxiety. The patient evaluated the pain on a 10-cm visual analog scale (VAS) ranging from 0 (no pain) to 10 (maximum pain possible) (Fig. 1). Patients

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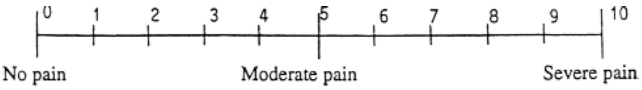

Figure 1: Diagram showing visual analogue scale.

were instructed that 0 represented no pain, 10 represented the worst pain, and that 1 to 3 were indicative of mild pain, 4 to 6 moderate pain, and 7 to 10 severe pain. The distance was then measured and recorded for comparison.

Three representative cases have been presented here. All the cases were performed in the Department of Periodontics and Implantology at DJ College of Dental Sciences and Research, Modinagar, Uttar Pradesh (India) after obtaining written informed consent from the patients.

CASE 1

A 55 year old patient reported with missing teeth in lower left and right back region. After assessing hard and soft tissue profile of the patient clinically which was found to be appropriate, it was decided to place implant in the edentulous region with 2 different technique i.e With-Flap and Flapless protocol.

Complete haemogram including Hb%, TLC, DLC, PCV, bleeding time and clotting time were done to evaluate the fitness of the patient for stage I surgery or implant placement. Oral prophylaxis was done before the scheduled implant placement. Subjects were advised to use 0.2% cholorhexidine gluconate mouthwash, twice daily for a

Figure 2: Orthopantomogram (OPG) for case 1.

period of 15 days. Instructions were given regarding oral hygiene maintenance for its importance for the success of implant therapy and constantly reinforced till satisfactory levels were achieved.

Pre –Treatment records include: Detailed medical and dental history; informed verbal and written consent; periodontal assessment using clinical parameters; diagnostic casts radiographic stent and surgical stent; periapical and panoramic radiographs; to calculate length at the implant site, radiograph stent was made and Orthopantomogram (OPG) was shot (Fig. 2).

Surgical procedure

Flap Technique (Fig. 3): After achieving adequate local anaesthesia, crestal incisions were placed on the edentulous site with no. 15 B.P. blade. The crestal incisions were extended to the mid buccal and mid lingual crevices of

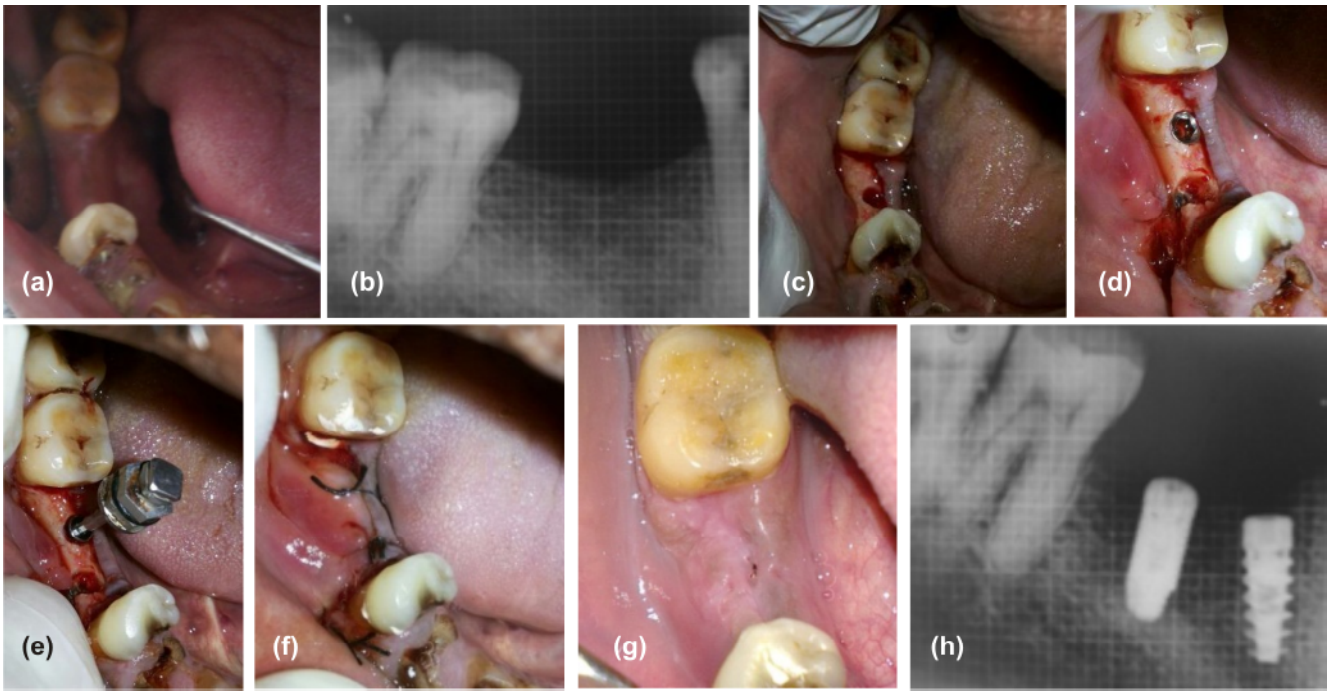

Figure 3: Surgical step with flap reflection technique for case 1 (a) pre-operative surgical site (b) pre operative IOPA of implant site (c) flap reflection and osteotomy site prepared (d) Implant placed (e) Hexdrive in use (f) suture placement (g) 7 day post operative surgical site (h) Post operative IOPA.

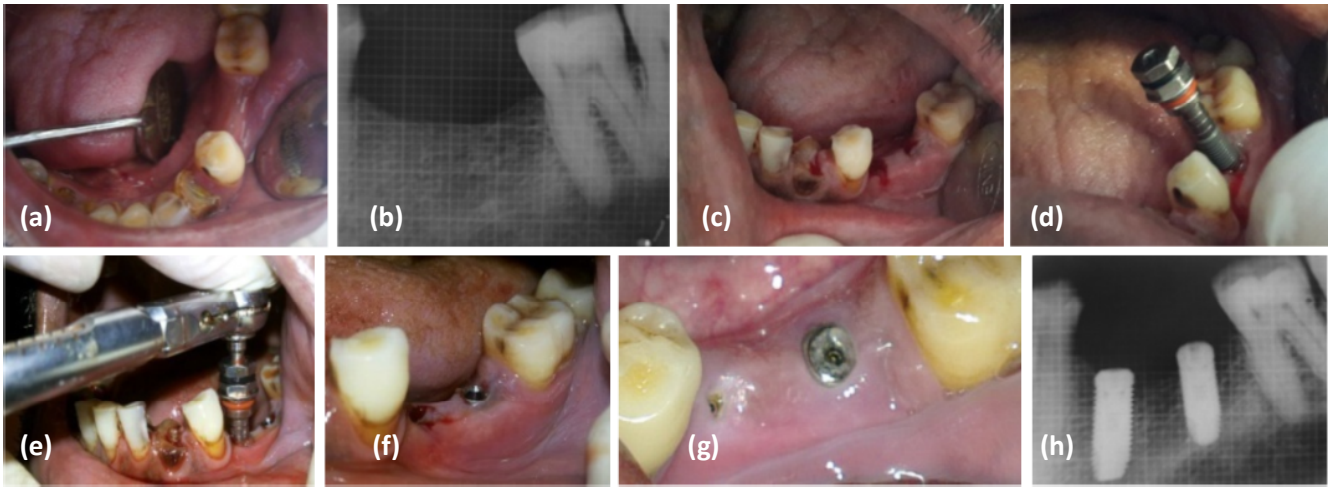

Figure 4: Surgical steps for flapless technique for case 1 (a) pre-operative surgical site (b) pre operative IOPA of implant site (c) osteotomy site prepared (d) Implant placed (e) Implant tightening done with torque ratchet (f) Implant placed in 35 & 36 region suture placement (g) 7 day post operative surgical site (h) Post operative IOPA.

adjacent tooth. Full thickness flaps were elevated using periosteal elevator.

Bone drilling was performed at revolutionary rates recommended by Branemark i.e. 1000-1500 RPM. Drilling was performed with copious irrigation to prevent overheating of the bone. Additionally, drills were intermittently and repeatedly "pumped" or pulled out of the osteotomy site while drilling to expose them to the water coolant and to facilitate clearing bone debris from the cutting surfaces and drills were used in progressively increasingly diameters.

The depth and angulations were checked continuously with the help of depth gauge paralleling pins which had depth markings. Once, the depth and angulation of the osteotomy was confirmed, use of subsequent drills for final osteotomy preparation capable of accepting the fixture dimension was accomplished. The implant site was generously irrigated with saline to ensure no debris or bone chips left at the base or attached to the vertical walls of the osteotomy site

Figure 5: Orthopantomogram (Case 2)

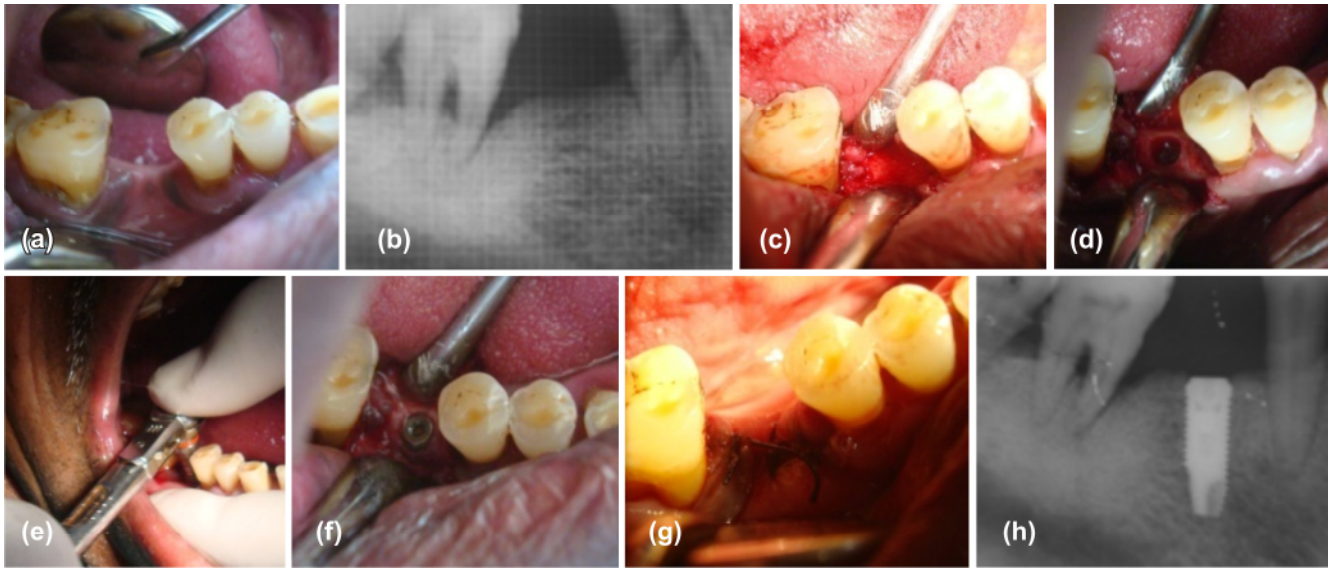

Figure 6: Surgical steps for flap technique for case 2 (a) pre-operative surgical site (b) pre operative IOPA of implant site (c) flap reflection (d) osteotomy site prepared (e) Implant tightening done with torque ratchet (f) Implant placed (g) suture placement (h) Post operative IOPA.

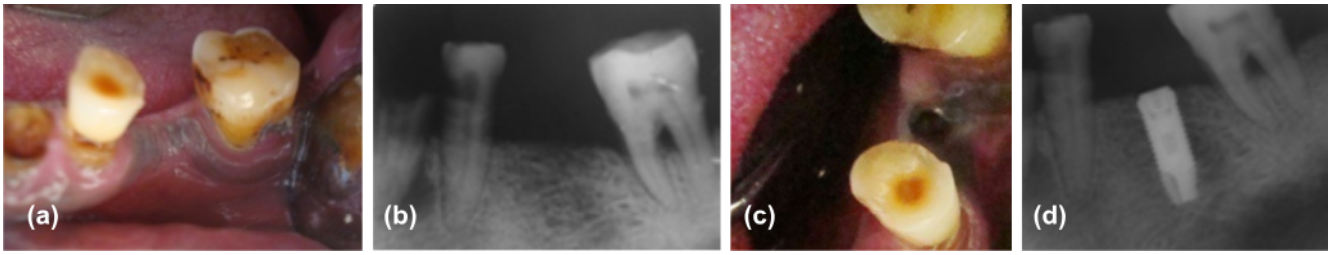

Figure 7: Implant plcaement with flapless technique (Case 2): (a) Preoperative surgical site; (b) Preoperative IOPA; (c) Implant placed without flap reflection; (d) Post operative IOPA

Figure 8: Orthopantomogram (Case 3)

following preparation. Implants were inserted by tightening manually with a torque ratchet (35-45 N cm) until seated in proper position.

Flapless Technique (Fig. 4): In this technique, drilling was done with a round bur to prepare the implant bed directly through the soft tissue was done, which was followed by sequential drilling to get a final osteotomy to accommodate implant. A periapical radiograph was taken during the osteotomy to ensure proper angulation and length of the proposed implant site. The parallel pins were placed to ensure proper angulation.

CASE 2

A 42 year old patient reported with missing teeth in lower left and right back region (Fig. 5). After assessing hard and soft tissue profile of the patient clinically which was found to be appropriate, it was decided to place implant in the edentulous region with 2 different techniques i.e with flap elevation (Fig. 6) and flapless protocol (Fig. 7).

CASE 3

A 52 year old patient reported with missing teeth in upper right front and lower back right back region (Fig. 8). After assessing hard and soft tissue profile of the patient clinically which was found to be appropriate, it was decided to place implant in the edentulous region with 2 different techniques i.e with flap elevation (Fig. 9) and flapless protocol (Fig 10).

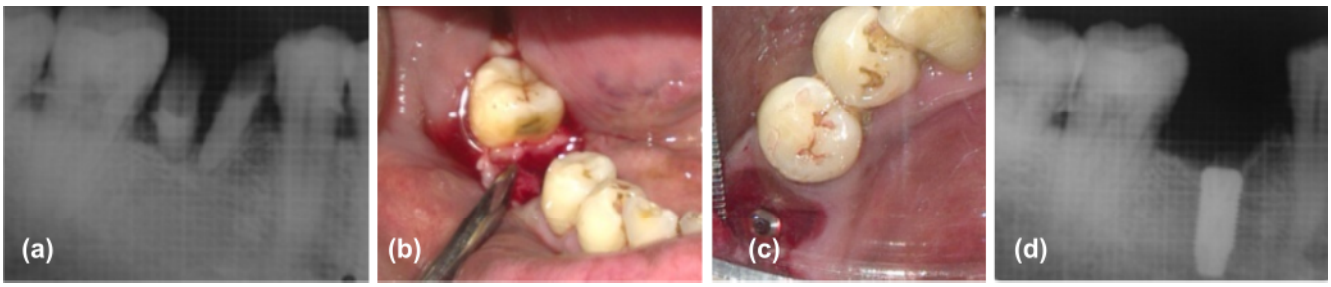

Figure 9: Implant plcaement with flap technique (Case 3): (a) IOPA showing decade root stumps; (b) Flap reflection and osteotomy site preparation; (c) Implant placed flap reflection; (d) Post operative IOPA

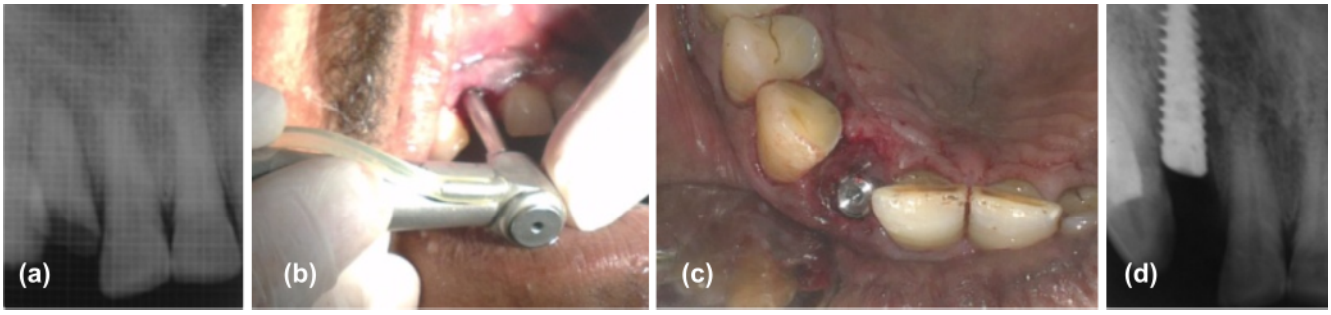

Figure 10: Implant plcaement with flapless technique (Case 3): (a) IOPA showing decade root stumps; (b) Preparaing osteotomy site without flap relfection; (c) Implant placed; (d) Post operative IOPA

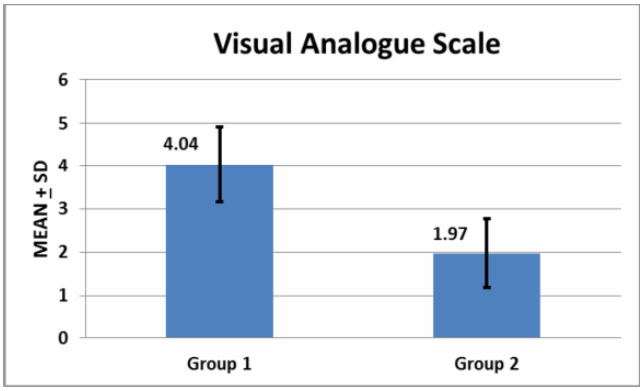

Figure 11: Diagram showing average score for VAS for group 1 (flap reflection) and group 2 (flapless technique)

OBSERVATION

It was observed that the pain felt by patient postoperatively measured on visual analogue scale was lesser for those placed through the flapless as compared to those which were placed with flap technique , which was statistically significant ($p<0.05$) (Fig. 11)**.**

DISCUSSION

Surgical placement of dental implants has undergone changes since the beginning of placement of root-form implants. Initially, using the branemark protocol, an incision in the mucosa or the mucobuccal fold was made, and then a flap was reflected to expose the underlying bone.[5] Scharf and Tarnow[6] demonstrated that there was no difference in the implant success rates when implants were placed with a midcrestal incision; however, they concluded that it was far more advantageous to use a midcrestal incision since the swelling and postoperative pain was greatly minimized.

When dental implants are placed after reflecting soft tissue flaps, there generally is some bone resorption, this is because when soft tissue flaps are reflected for implant placement, blood supply from the soft tissue to the bone is removed, thus leaving poorly vascularised cortical bone without a part of its vascular supply, prompting bone resorption during the initial healing phase. With a flapless approach, surgical trauma is minimal because the circular incision is very small, usually 1mm wider than the implant to be placed, so that postoperative pain, swelling and discomfort related to soft tissue trauma are greatly minimized.[7]

Patient acceptance of the flapless technique has been very high. Patients who have had placed implants with a flapless approach and also the convectional technique clearly prefer a flapless approach. Swelling and pain can be greatly avoided when there is no flap reflection, and patients also realize that there is no need to suture, which makes them believe that surgical trauma is lessened. Most patients, when having implants placed with flapless surgery, require minimal post-operative medication. There is no occurrence of hematoma compared to the conventional flap approach, in which it is not rare to observe postoperative hemorrhage. There are many advantages for the patient as well as for the surgeon, since the procedure is less time consuming, bleeding is minimal, implant placement is expedited, and there is no need to place and remove sutures.[8]

CONCLUSION

Since flapless implant placement generally is a “blind” surgical technique, care must be taken when placing implants.Flapless implant surgery is a predictable procedure when patient selection and surgical technique are appropriate. As with every technique, there are some advantages and disadvantages associated with flapless surgical implant placement. It is the implant surgeon who should make the decision to place implants using flapless approach, depending on the quantity and morphology of the bone that will receive the implants and based on his or her own surgical expertise and technique.

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