

**Immediate Temporization of Immediate Implant Placement with Flapless Elevation in the Anterior Esthetic Zone:**

**A Case Report.**

<sup>1</sup>Dr Rajput Poonam, Post Graduate, <sup>2</sup>Dr Jindal Vikas, Professor, <sup>3</sup>Dr Chauhan Shiva, Senior lecture, <sup>4</sup>Dr Choudhary Alka, Post Graduate

<sup>1, 2, 3</sup>Department of Periodontics, Himachal Dental College, Sundernagar

<sup>4</sup>Department of Prosthodontics, Himachal Dental College, Sundernagar

**Corresponding Author:** Dr Rajput Poonam, Post Graduate, Department of Periodontics, Himachal Dental College, Sundernagar

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**Abstract**

Extraction sites in the anterior maxilla can present restorative challenges with regard to esthetics. Resistance to wearing a temporary removable partial denture during healing makes immediate implant therapy an appealing alternative to patients. Implant placement into fresh extraction sockets using no flap elevation has recently become more popular due to some advantages including less bleeding, swelling, and the preservation of existing soft tissue contours. This case report describes the replacement of a maxillary left central incisor with the placement of an immediate implant and a provisional restoration following a minimally invasive extraction to preserve anterior esthetics.

Dental Implants are considered as a most definitive treatment option to replace missing teeth both for esthetics and functional purpose.<sup>1</sup> The concept of osseointegration was first introduced by Brånemark in 1964, and he gave guidelines for obtaining a direct connection between bone and titanium in 1977.<sup>2</sup> In early 70s and 80s implants were placed in healed extracted sockets.<sup>3</sup> Then, it was in the 90s that implant placement started in fresh extracted

sockets or in partially healed extracted sockets predominantly for implants in the esthetic zone.<sup>4</sup>

Anterior single tooth replacement with immediate implant has become a predictable and well-established treatment modality in the modern implant practice, which not only gives better aesthetic outcome but also preserve the soft and hard tissue. In these cases, restoration protocol is also a great challenge for clinicians because of esthetic demands of patients. Atraumatic tooth removal, placing a single implant properly with contoured temporization bring success in the esthetic zone.<sup>5</sup> In first few months after the extraction there is rapid resorption of the alveolar ridge, both in vertical and horizontal directions.<sup>6,7,8</sup> In anterior region, loss of tissue hinders the aesthetic and prosthetic rehabilitation and changes in gingival contour, loss of dental papilla with the appearance of black triangles.<sup>9</sup> The atraumatic extraction and implant placement in the alveoli of the extracted tooth and immediate temporization have been proposed as alternatives to maintain the volume and tissue contour, decreases cost and time of treatment.<sup>10,11</sup> It also helps in the preservation of vascularity, soft tissue architecture, hard tissue volume, and accelerated recuperation, allowing

the patient to resume normal oral hygiene measures immediately after extraction.<sup>12</sup>

There are several techniques of immediate implant placement i.e with and without Flap elevation (minimally invasive surgical approach). In case of immediate implant placement if a mucoperiosteal flap was reflected there was increased crestal bone loss, loss of interdental papilla<sup>13</sup>, remodeling of the exposed bone surface<sup>14</sup> and induces gingival recession.<sup>15,16</sup> Hence, the immediate implant placement procedure without reflecting a mucoperiosteal flap may reduced bleeding, maintain soft tissue contour & reduced post-operative patient discomfort.<sup>17</sup> The amount of recession in this technique is 1-1.5 mm after 1 yr which was considered negligible.<sup>13</sup> The indications of immediate implant placement with flapless elevation are non vital fractured tooth at the gingival margin, endodontic failure and root caries.<sup>18</sup> The only contraindication of flapless procedure is that it is a “blind procedure”, that make implant placement difficult.<sup>19</sup>

According to the conventional protocol, after the placement of implant it is recommended to have 3-6 months of load free healing period for successful osseointegration to occur. But such a long period is an obvious drawback to patient acceptance. Now a days the concept of immediate temporization has become popular due to less trauma, reduced treatment time, decreased hard and soft tissue resorption and increased patient acceptance, along with better function, aesthetics and psychological benefit.

**Wohrle in 1998** was the first to introduce the concept of immediate temporization and upto present it is proven to be a predictable treatment approach in implant dentistry.<sup>20</sup>

The aim of this clinical case report is to maintain the harmony of soft and hard tissue by atraumatic extraction

and flapless placement of immediate implant with immediate temporization in anterior esthetic zone.

### **Clinical Case Report**

A 34 years old female presented to the Department of Periodontics and implantology, Himachal Dental College, Sundernagar with the chief complaint of discoloration and mobility in upper left front tooth region. On clinical and radiographic examination revealed that tooth was periodontally compromised and there was Grade III mobility with root resorption but no periapical pathology was present and prognosis was unfavorable. Pre-surgical radiographic evaluation was done with IOPAR, RVG, OPG that revealed adequate height as shown in figure 1,2,3,4. The width of bone was determined by utilizing a bone sounding technique for implant placement w.r.t 21. So, it was planned to place the implant measuring 3.30 x 11.5 mm in dimension along with immediate temporization to maintain the emergence profile and to preserve the alveolar bone. A preliminary impression of the maxillary arch was made with alginate, and a provisional crown was fabricated for immediate temporization of the implant.

### **Surgical Procedure**

On the day of surgery the patient received 2 g of amoxicillin 1 hour before surgery, and 1 g of amoxicillin 6 hours after surgery to reduce the risk of infection. Patient was asked to rinse with 0.2% chlorhexidine digluconate solution for 1 minute before the procedure. After administration of local anesthesia (2% lignocaine HCL containing 1:80000 performed without flap elevation to preserve the integrity of the interproximal soft tissue and remaining buccal and lingual bony plates. The tooth was carefully extracted by using forcep, with slight twisting movements, to avoid any trauma to the bony margins of the alveolus as shown figure 5. Granulation tissue was carefully curetted and removed. The alveolar

socket was irrigated using sterile saline solution. There was absence of fenestrations or dehiscences of the bony walls and residual gap was  $\leq 2$  between the implant surface and surrounding bony walls.

The implant site preparation was initiated with a small pilot bur with diameter 1.9 mm for proper drill orientation. The pilot bur was angled palatally to preserve the buccal wall of alveolar bone make the initial osteotomy till a depth of 11.5 mm. Subsequent drilling was done till diameter of 3.30 mm and a counter sink was given with 3.45 mm drill as shown in figure 6. Implant insertion in the osteotomy site was done by using torque ratchet till all threads were submerged into bone, implant was placed 3 mm below the crest of the ridge with insertion torque of 45 Ncm and with adequate primary stability as shown in figure 7. Postoperative OPG, IOPAR, and RVG were taken for confirming the accuracy of implant placement as shown in figure 8,9,10. Abutment was attached to the implant body and prepared for parallelism for adequate space as shown in figure 11. Temporization was done with fabricated self-cure acrylic crown on the same day by using patient's own pre extraction records as shown in figure 12,13. The occlusion was adjusted to clear all contacts in maximum intercuspation and in lateral and protrusive excursions any occlusal contacts during centric and eccentric movements on the provisional restoration were eliminated as shown in figure 14. Antibiotic (Amoxicillin & Clavulanic Acid 625 mg, twice daily for 5 days) and Anti-inflammatory (thrice daily for 5 days) were prescribed and post-operative instructions were given. Post operative photograph, OPG, RVG were taken after 3 month as shown in figure 15, 16, 17 and after 6 months temporary crown was removed and abutment was replaced by impression coping, impression was made with open tray technique using light body and

putty polyvinyl siloxane rubber base material Impression was sent to the laboratory for fabrication of zirconia crown and cemented to the abutment as shown in figure 18.

Follow-up was done after 3, 6, month's interval.



Figure1: Pre-operative photograph

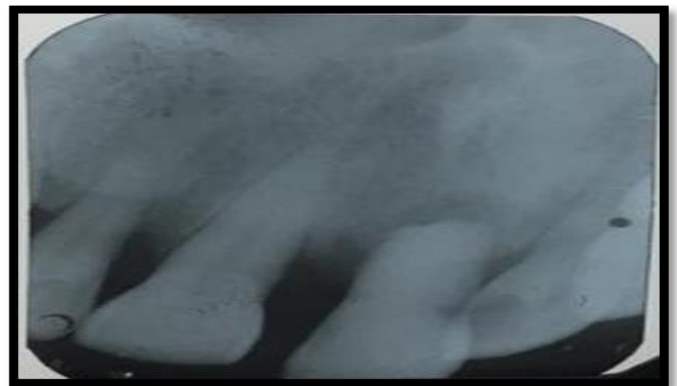


Figure 2: Pre-operative IOPAR

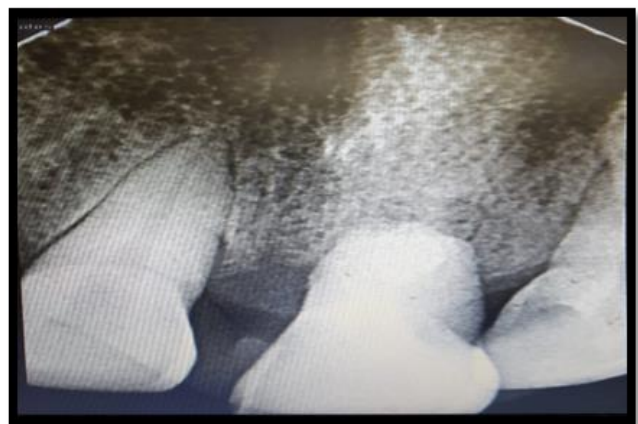


Figure 3: Pre-operative RVG



Figure 4: Pre-operative OPG



Figure 8: Post -operative OPG



Figure 5: Atraumatic tooth extraction

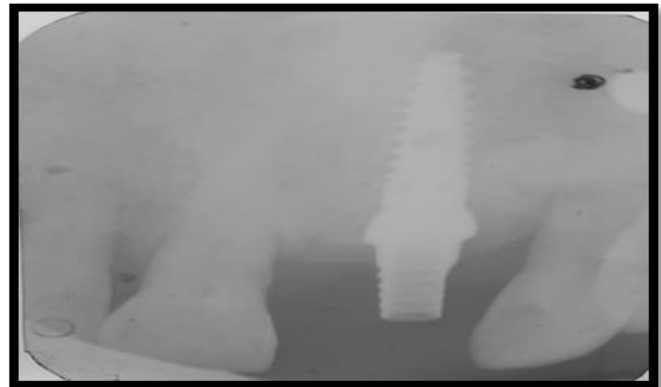


Figure 9: Post operative IOPAR



Figure 6: Osteotomy done

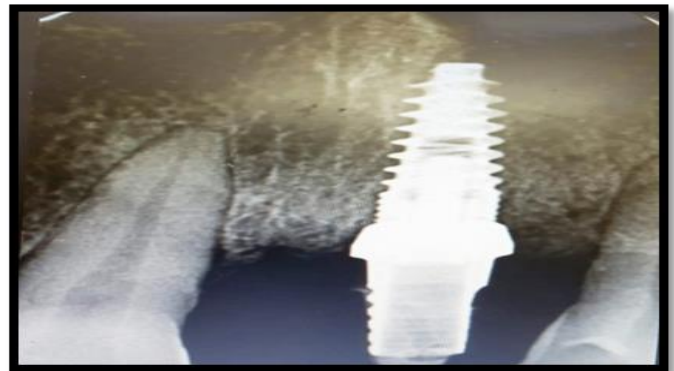


Figure 10: Post-operative RVG



Figure 7: Implant placed



Figure 11-Abutment placed



Figure 13: Temporary Crown

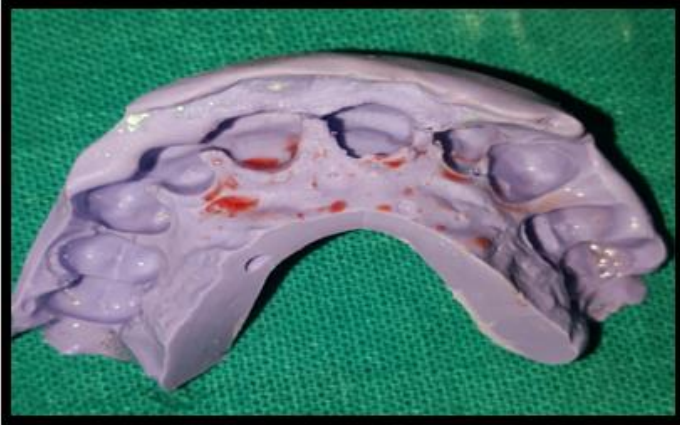


Figure14: Immediate temporization

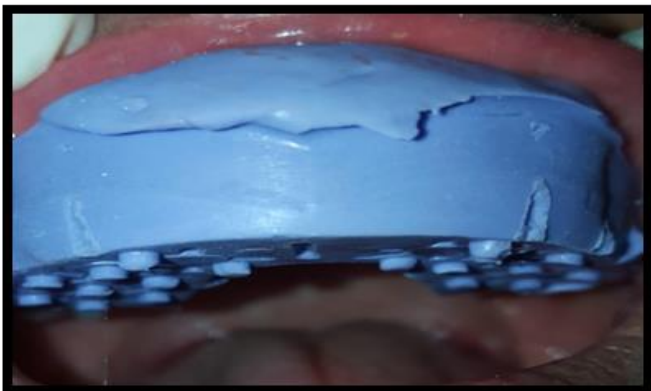


Figure 15: 3month post operative photograph

Figure 12: Steps of fabrication



Figure 16: Post operative 3 month OPG

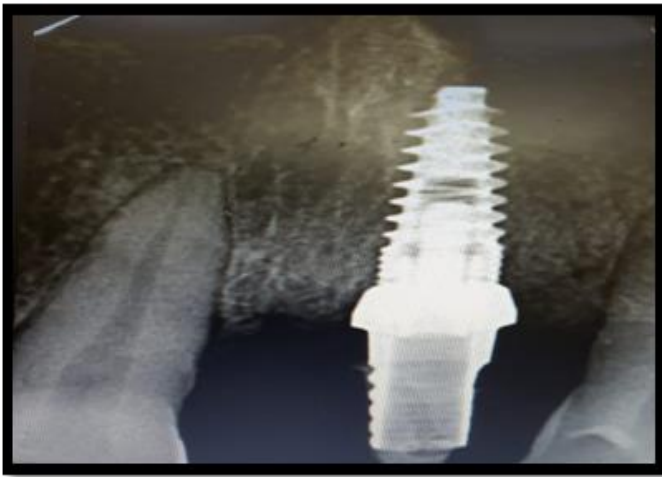


Figure 17: Post operative 3 month RVG



Figure 18- 6: month Post- operative

## Discussion

Immediate implant and immediate temporization may be a good treatment option for the loss of anterior teeth.<sup>21</sup> Its success rate in maxilla is 66-95% and in mandible is 90-100%.<sup>22</sup>

According to **Vanden BL in 2005**, there are many advantages of placing implants in fresh extraction sockets and immediate temporization of implant reduces the shrinkage of hard tissue and soft tissue recession.<sup>23</sup>

According to **Chen S in 2007** there is a risk of mucosal recession and adverse soft tissue aesthetics with immediate implant placement. However, this risk may be reduced by avoiding a buccal position of the implant in the extraction socket.<sup>24</sup>

The study done by **Papaspyridakos, Kinsel RP in 2008** immediate provisionalization of dental implants enables the patient to avoid the physical discomfort of wearing a removable interim prosthesis or the psychological trauma of a compromised smile.<sup>25</sup> The provisionalisation makes it possible to condition implant soft tissues in order to preserve the interproximal papillae and to restore a curved/rounded appearance of the gingival margin; it also permits immediate healing of the soft tissue with the formation of an adequate mucosal seal.<sup>26</sup>

The immediate replacement of the missing root with a postextraction implant avoids the loss of bone in height and width.<sup>27</sup>

According to **Blanco J in 2008, You TM, 2009** Flapless implant placement permits a reduction of bone resorption, which occurs when periosteal tissue is separated from underneath cortical bone.<sup>28</sup> Moreover, it reduces surgical and post-surgical times, which are necessary to remove the stitches, and reduces total costs as a result of the non-use of scalpel blades, needles and thread.<sup>29</sup>

The initial stability of the implant is essential for immediate loading, minimum insertion torque has to be equal or superior to 32N/Cm and micromovement should not exceed beyond 150um.<sup>22</sup> The main contraindication for immediate loading are bruxism and lack of primary stability.<sup>30</sup>

In a study by **Jo et al 2001** success rate of 98.9% was observed for implants that were placed in fresh extraction sockets and immediately loaded.<sup>31</sup> **Limdeboo in 2006** showed after 1 year of implant placement, there was no statistically significant difference in gingival esthetics or complications in immediate versus delayed group. **Shibly O et al 2012** showed that implant survival rate of immediate implant was found to be 96.6% in immediate loading group and 93.3% in conventional loading.<sup>33</sup>

In this case report, primary stability 45NCm was achieved by extending osteotomy 3mm beyond the apex of socket. There was no need for bone augmentation because gap between the implant and bone was less than 2mm and the implant diameter closely match with the socket dimension.

### Conclusion

Based on the outcomes of the present case report, it can be concluded that a traumatic tooth extraction and flapless immediate implant placement with immediate loading may be a viable treatment option for this case. However, this approach is considered highly technique sensitive and requires proper execution.

Careful selection of cases, proper treatment plan and follow-up of surgical and prosthetic protocols are the keys to success in this case.

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