

# Immediate Loading of Implants with Overdenture

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## I . Introduction

The purpose of this report is to present the usefulness of temporary denture used in immediate loading overdenture cases. A literature review of the experimental research indicated that early loading itself was not a contra-indication to successful osseointegration.<sup>1)</sup>

In complete edentulous patients, long term use of complete denture may cause alveolar bone loss and it may occur the pain. In order to solve like this problem the fact that implant implantation is one method. But for change to fixed prosthesis it needs many implants. It can be a burden on economic and operation problem to patients. The method to solve like this problem is the implants related overdenture. Especially in mandible after implantation we can use temporary denture to immediate loading, to reduce the patient's edentulous period. Implant retained overdentures proved to be a predictable and effective method in management of edentulous patients. With the resultant high success rates in excess of 90%.<sup>2)3)4)5)</sup>

In this method we can make some holes on temporary denture and use it as surgical template, and after surgery the temporary denture can wear to patients for immediate loading.

## II . Materials & Methods

Two patients have used this method for restoration. They were all have 4 implants and immediate loading with temporary dentures. Implants were implanted at lower lateral incisor and premolar site for separate the bite force(Fig.2,12), and second molars of temporary denture were removed for decrease cantilever effect(Fig.5,10).

One week after the PSI(Dio,Dong Seo Inc.,Korea) was implanted, the patient had to wear a temporary denture, and the day after the Tapered Screw Vent (Zimmer Dental Inc. , U.S.A) was implanted, they had to wear a temporary denture. The transition from the temporary denture to the final prosthesis PSI(Dio,Dong Seo Inc.,Korea) took 4 months and the Tapered Screw Vent(Zimmer Dental Inc.,U.S.A) took 2 months.

Implants and dentures are connected with locator attachment (Zestanchors Inc.,U.S.A) in final prosthesis (Fig.7,8,12,13). One case used PSI(Dio,Dong Seo Inc.,Korea) implant, and the other case used Tapered ScrewVent (Zimmer Dental Inc.,U.S.A) implant.

Case1: The patient is 70 years old man. He had already wear ball attach denture on mandible and partial denture on maxilla for several years. He came to our hospital with pain and fractured abutment on left lower canine(Fig.1).Panoramic radiologic view was taken for analysis. 4 PSI (Dio,Dong Seo Inc.,Korea) fixtures were planned and implanted(Fig.2).



Fig.1 Pre-operation panoramic view



Fig.2 Post-operation panoramic view

The old denture was used for surgical template by make some holes on that (Fig 3). one week after implantation, temporary denture was worn to patient (Fig.5).



Fig.3 Drilling with old denture



Fig.4 after suture



Fig.5 temporary denture



Fig.6 temporary denture removed for gingiva cleansing

After 4 months temporary denture was transition to final prosthesis. Implants and denture is connected with locator attachment(Zestanchors Inc.,U.S.A) (Fig.7,8,9,10).



Fig.7 locator attachment and final prosthesis



Fig.8 connecting the locator attachment



Fig.9 final prosthesis



Fig.10 after final prosthesis placed

Cases 2: The patient is 77 years old man. He has already wear partial denture on mandible. In this case, panoramic view and computed tomography(CT) was taken for evaluation of implant placement in relation to available bone, anatomic structures, and proposed tooth positioning(Fig. 11,12,13).

Presurgical prosthetic treatment planning should result in fabrication of an accurate surgical template to be used by the surgeon at the time of implant placement.



Fig.11 pre-operation panoramic view

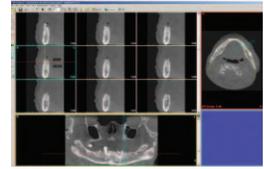


Fig.12 pre-operation CT analysis

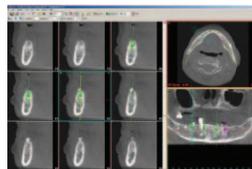


Fig.13 pre-operation implants simulation

In this case, because the old denture was partial denture, we can't use it as temporary denture. So we had made an temporary denture, and used it as surgical template. 4 Tapered ScrewVent(Zimmer Dental Inc.,U.S.A) implants were planned and implanted(Fig.14,15,17). Because bone width was not enough, ridge expansion was done before implantation (Fig.16).



Fig.14 post-operation panoramic view



Fig.15 drilling with temporary denture



Fig.16 ridge expansion



Fig.17 after implantation

The day after implantation, when dressing the wound, temporary denture was worn to patient. It's connected with implant mount (Fig 18,19,20,21).



Fig.18 temporary denture fixed on implant mount with resin



Fig.19 temporary denture with implant mount



Fig.20 occlusal surface of temporary denture



Fig.21 temporary denture setting

After 2 months, temporary denture was transition to final prosthesis. Locator attachment (Zestanchors Inc.,U.S.A) was used like first case(Fig.22,23,24,25).



Fig.22 locator attachment



Fig.23 inner surface of final prosthesis



Fig.24 occlusal surface of final prosthesis



Fig.25 final prosthesis placed

### III. Result

One week after the PSI(Dio,Dong Seo Inc.,Korea) was implanted, the patient had to wear a temporary denture, and the day after the Tapered Screw Vent (Zimmer Dental Inc.,U.S.A) was implanted, they had to wear a temporary denture, however in both cases, they were immediately loaded, so there were no differences in use. The transition from the temporary denture to the

final prosthesis PSI(Dio,Dong Seo Inc.,Korea) took 4 months and the Tapered Screw Vent(Zimmer Dental Inc.,U.S.A) took 2 months.

### IV. Discussion

This method can be successfully used, if correctly select the cases. As we can see from the above patients, both patients use dentures for their upper jaws and they are elderly so they have weaker masticatory force so it was possible to plan for immediate loading. The indication for the case selection for immediate loading is based on an optimal stabilization of the implants through a large number or on implants in a very good bone quality or quantity (interforaminal). Through secondary splinting with the suprastructure, possible micromovement during the healing period can be prevented in both situations.

Salama and coworkers<sup>6)</sup> reported on 2 patients in whom all titanium root-form implants, loaded immediately with provisional restorations, osseointegrated and were restored with fixed prosthesis in maxilla and the mandible using IMZ implants and Brånemark System implants, respectively. Tarnow and coworkers<sup>7)</sup> reported on the immediate loading of threaded implants at stage 1 surgery in 10 edentulous arches (6 mandible and 4 maxilla) with 1-and 5-year follow-up data. They used Brånemark System implants in 6 patients, Astra TiOblast implants in 2 patients, ITI Bonefit implants in 1 patient, and 3i implants in 1 patient. 67 of 69 immediately loaded implants and 37 of 38 submerged implants integrated. Their results indicate that immediate loading of multiple implants that are rigidly splinted around a completely edentulous arch can be a viable treatment modality.

Based upon the results of reports, guidelines of immediate loading are suggested as follows.<sup>8)</sup>

1. The length of immediately loaded implants probably should be at least 8.5mm (wide platform) or 10mm(regular platform).
2. Implants with good primary stabilization (placement torque of more than 40Ncm) can be immediately loaded.
3. Implants with placement torque < 40Ncm, length < 8.5mm (wide platform) or 10mm (regular platform), or associated with bone grafting probably should be

submerged.

4. Cantilevers should be avoided in the provisional prosthesis.

We used the locator attachment (Zestanchors Inc.,U.S.A) from among the many attachments to connecting implants and final prosthesis, however, the advantages of this attachment are that it is easily maintained, it can be used in small interocclusal space, it is possible to select the method of maintenance, and it is possible to compensate for the angles between implants at up to 40 degrees.<sup>9)</sup>

It will be much easier to select an attachment if we know the advantages and disadvantages of each attachment.

## V. Conclusion

The biggest advantage of this method is that it can be loaded as soon as, and the temporary denture is used as a surgical template for implantation, it is possible to load, and this is convenient for both the dentist and the patient. However, immediate loading is not possible in all cases, and correct case selection is highly important.

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## Abstract

## Implant overdenture 치료시 immediate loading 임상증례

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본 임상 증례는 임프란트를 이용한 무치악의 즉시하중시에 있어서 임시 틀니의 유용함을 검토하기 위한 보고이다. 완전무치악 환자에서 장기간의 틀니 사용은 치조골의 흡수를 야기해 저작불능 및 동통과 같은 문제를 야기하게 된다. 이런 문제를 해결하기 위하여 임프란트를 식립하는 것이 하나의 방법이다. 하지만 임프란트를 식립해 고정성 보철물로 전환하기 위해서는 많은 임프란트를 식립하여야 하며, 이것은 환자로 하여금 경제적 및 수술에 대한 부담을 갖게 한다는 문제를 안고 있다. 이런 문제를 해결하기 위한 방법 중 하나가 임프란트를 이용한 overdenture 이다. 특히 하악과 같은 골질이 좋은 부위에서는 임프란트를 식립후 임시틀니를 사용해 immediate loading을 해줌으로써 무치악의 기간을 단축해 환자로 하여금 불편함을 줄여주는 역할을 할 수 있다. 특히 이때 사용하는 임시틀니는 술자가 수술시 stent로 사용할 수 있게 원하는 위치에 hole을 형성하여 임프란트 식립시 정확한 위치에 식립 할 수 있게 도움을 줌은 물론, 술 후에는 그것으로 바로 환자에게 장착해 줄 수 있다는 장점을 갖고 있다.

두 증례에서 이와 같은 방법을 사용하였으며, 모두 하악에서 4개의 임프란트를 식립 후 locator attachment를 이용해 임프란트와 denture를 연결하였다. 한 case에서는 Dio 임프란트를 사용하였으며, 다른 case에서는 Tapered ScrewVent 임프란트를 사용하였으나 immediate loading을 하여 고정을 얻는데 있어서는 큰 차이는 없었다. 그러나 최종 보철물로 교체하는 시기는 Dio에서는 4개월, Tapered ScrewVent에서는 2개월의 시간을 가지고 진행하였다.

이 방법은 임시틀니를 stent로 사용하고 식립 후 바로 loading을 할 수 있다는 것이 매우 큰 장점이고, 이것은 술자 및 환자 모두에게 편리함을 가져다 준다고 판단된다.