RESEARCH

Is autogenous cortical bone sheet reliable for the management of defects around dental implants by using scalpel technique?

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Selcuk Dent J, 2020; 7: 34-38 (Doi: 10.15311/selcukdentj.519320)

Başvuru Tarihi: 29 Ocak 2019
Yayına Kabul Tarihi: 01 Şubat 2019

ABSTRACT

Is autogenous cortical bone sheet reliable for the management of defects around dental implants by using scalpel technique?

Background: The aim of this study is to present a very easy technique for coverage of dehiscence and fenestration defects around the dental implants from the nearest bone source by using a sharp scalpel and the analysis of its clinical results.

Materials and Methods: 750 screw dental implants were inserted by the same surgeon. Exactly 112 of the (15%) implants had dehiscence defects and 23 of them (3 %) had fenestration defects. A bone sheet was obtained from the nearest available cortical bone for covering a bone defect around an implant by using a new no: 15 scalpel. Survival rates of implants were evaluated.

Results: One hundred and thirty-five exposed implant surfaces were augmented with autogenous bone, harvested by scalpel technique. The survival rate of these implants was 100% with no significant clinical finding.

Conclusion: The scalpel technique described in the present study is easy, effective and reliable for the management of dehiscence or fenestration defects of dental implants.

KEYWORDS

Autogenous bone grafting, defects around dental implants, dental implants

ÖZ

İmplant etrafı defektlerin kapatılmasında bistüri tekniğiyle elde edilen otojen kemik tabakaları güvenilir mi?

Amaç: Bu çalışmanın amacı, keskin bir bistüri yardımıyla en yakın kemik kaynağından dental implantların etrafındaki dehisens ve fenestrasyon defektinin kapatılmasında basit bir tekniği ve bunun klinik sonuçlarının analizini sunmaktır.

Gereç ve Yöntemler: Aynı cerrah tarafından 750 vidalı dental implant yerleştirildi. İmplantların 112 sinde dehiscence tarzında defekt ve 23'ünde ise (% 3) fenestrasyon tarzında defekt bulunuyordu. 15 nolu bistüri kullanılarak en yakın kortikal kemikten elde edilen kemik tabaka implant etrafındaki defektleri kapatmak için kullanıldı. Sağ kalım oranları değerlendirildi.

Bulgular: 135 adet implantın açıkta kalan yüzeyi, bistüri tekniği kullanılarak alınan otojen kemik ile kapatlmıştır. İmplantlar klinik bir bulgu göstermemiş ve sağ-kalım oranı% 100 dur.

Sonuç: Dental implantların dehisens veya fenestrasyon defektlerinin tedavisinde kullanılan bistüri tekniği kolay, etkili ve güvenilirdir.

ANAHTAR KELİMELER

Otojen kemik grefti, dental implant etrafı defektler, dental implantlar

Alveolar ridge resorption in edentulous patients may interfere with the safe and correct insertion of oral implants. In most of the cases, the amount of bone available is not enough to place the implants securely. The fenestration or dehiscence of the surrounding bone of the implant occurs from insufficient bucco-lingual alveolar width or inadvertent misdirection during implant placement.[1] Autogenous bone, graft materials and/or barrier membranes have been used to manage defects around dental implants. [2-6]

The aim of this study is to present a very easy technique for coverage of dehiscence and fenestration defects from the nearest bone source by using a sharp scalpel and the analysis of its clinical results.

MATERIALS AND METHODS

750 screw dental implants were inserted by the same surgeon in the department of Oral and maxillofacial Surgey at Baskent University. One hundred and twelve of the implants (15%) had dehiscence defects. Twenty-three of them (3%) had fenestration defects. (Defects were classified according to the measurement between the bottom point of defect and the beginning of the titanium surface for dehiscence, diameter of exposed surface for fenestration.) Fifty-eight of these defects (43%) were mild (<2 mm) and 62 (46%) were moderate (2–4 mm), while 15 of them (11%) were severe (>4 mm). All dehiscence and fenestration defects around dental implants were covered with autogenous bone, harvested by scalpel technique (Figures 1–4). Crestal incision with flap elevation in gingival former application was performed in 13 of 135 implants. Average follow-up period of the implants is 4 years.

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Figure 1.

Insufficient bucco-lingual alveolar width

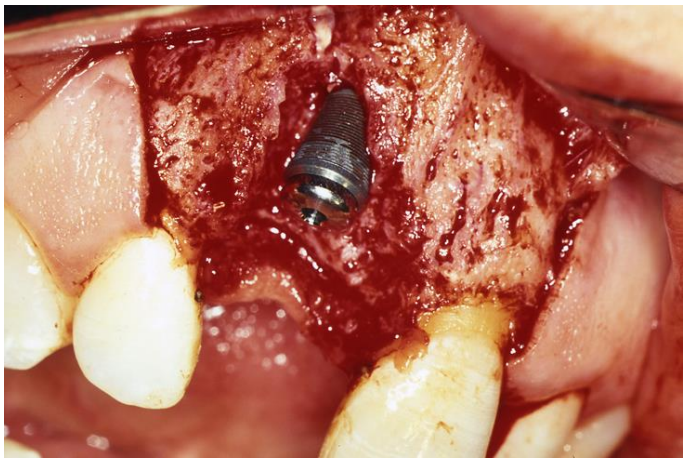

Figure 2.

Following implant insertion, dehiscence defect (2–4 mm) was covered by harvested bone sheet obtained from the lateral aspect of the alveolus

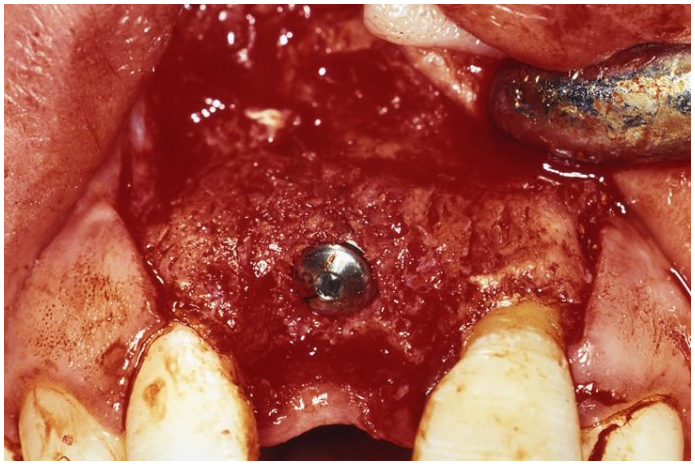

Figure 3.

Fenestration type of defect which occured following implant insertion was covered by a sheet of bone that was obtained from the very nearest labial alveolar bone

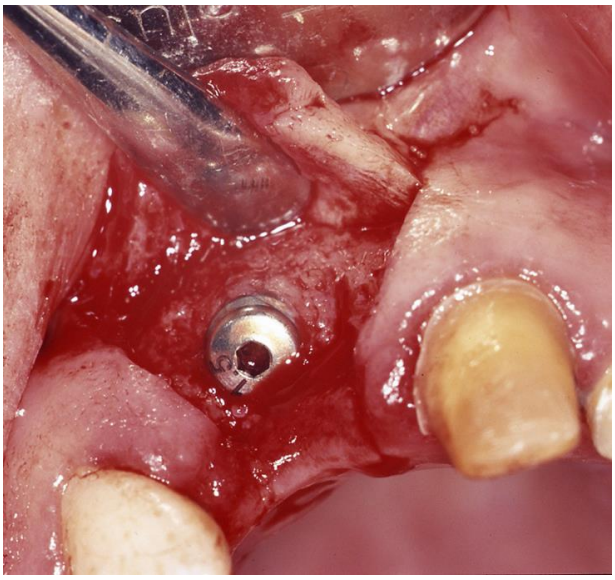

Figure 4.

Healing of bone graft at 5 months postoperatively

Surgical technique

Following implant insertion and observing a dehiscence or fenestration defect of 1 mm or more, by using a new no: 15 scalpel, a bone sheet was obtained from the nearest available cortical bone. Bone was obtained either from the top of the alveolar crest at edentulous areas or from the labial or buccal cortical bone, especially from the buccal interradicular area. Scalpel was slightly angulated to the surface of the cortical bone and moderate force was applied. After maintaining a small gap, scalpel was reangulated against to the bone, depending on the desired bone sheet thickness (Figure 5). A retractor was used to protect the soft tissues to avoid injury in case of accidental scalpel slip. The bone sheet removed was round in shape just like the implant surface. It adapted perfectly to the implant surface. Gentle tapping adapted and stabilized the graft (Figures 6–14).

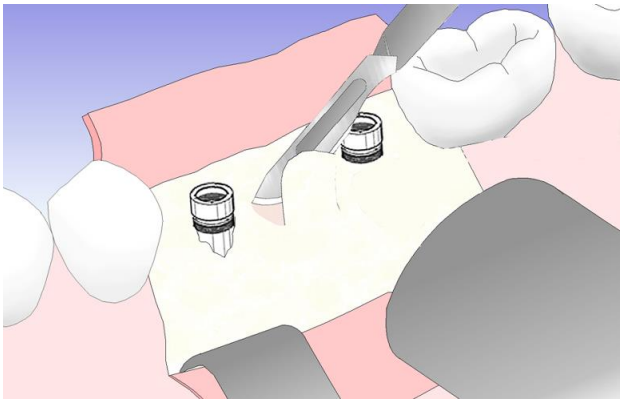

Figure 5.

Illustration of obtained bone sheet by using scalpel technique

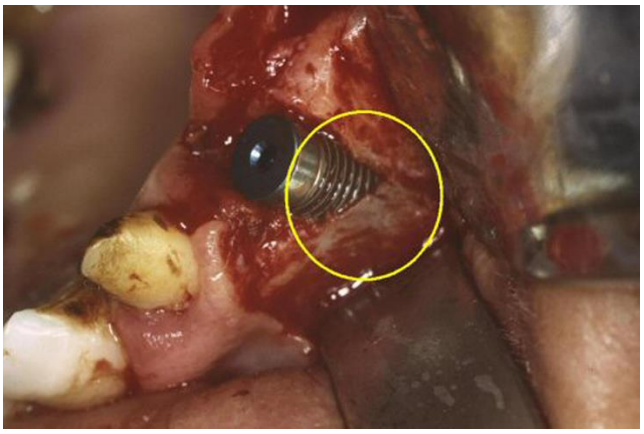

Figure 6.

Following implant insertion, 2 mm dehiscence defect was covered by harvested bone sheet obtained from the lateral aspect of the alveolus. An example of a dehiscence type defect which was classified in the first group (up to 2 mm)

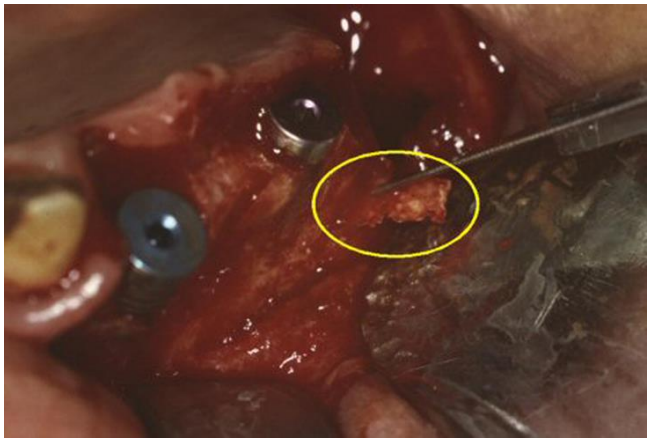

Figure 7.

Bone sheet is obtained by using scalpel technique

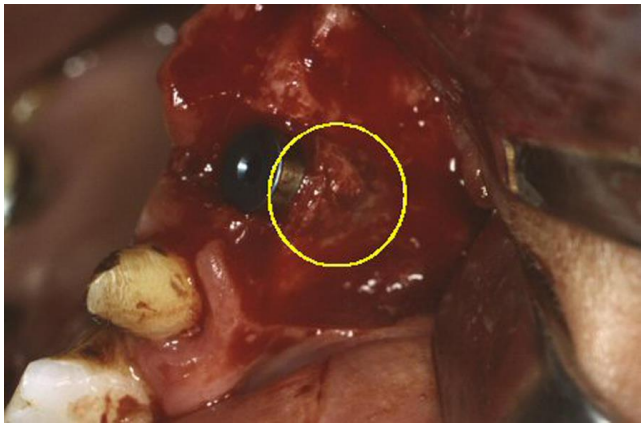

Figure 8.

Bone is secured to the defect by gently placing it between the implant and alveolar bone

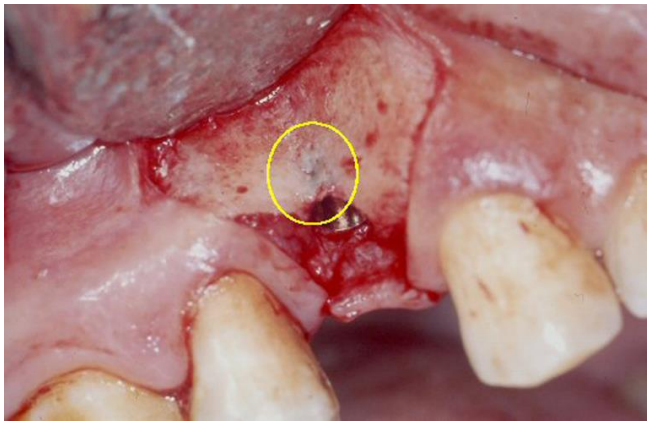

Figure 9.

A very thin alveolar bone on the buccal surface of the implant

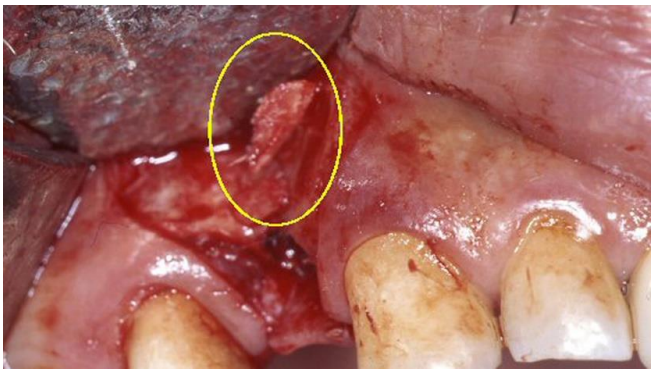

Figure 10.

Bone sheet is obtained by using the scalpel technique

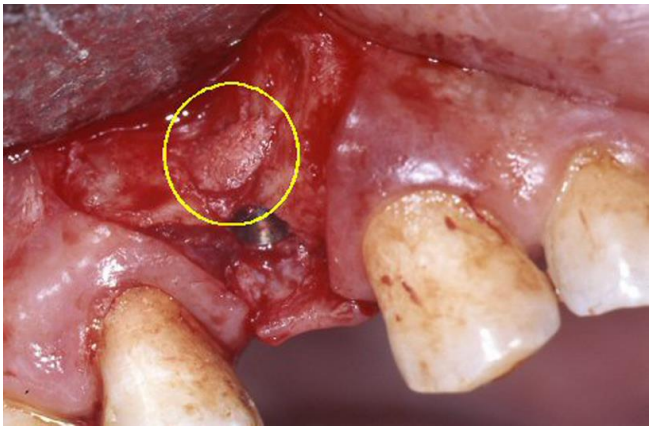

Figure 11.

The buccal surface of the implant was covered through the presented technique to avoid possible resorption

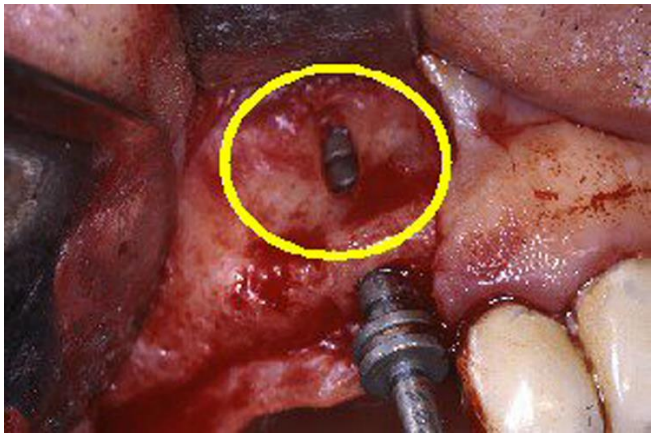

Figure 12.

Fenestration type of defect which occured following implant insertion

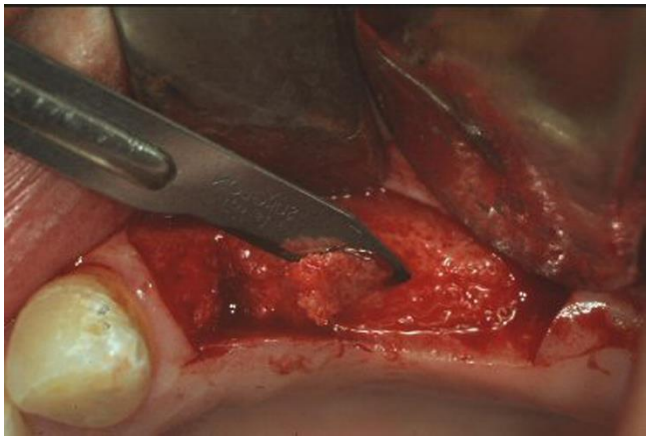

Figure 13.

A sheet of bone that was obtained from the very nearest labial alveolar bone

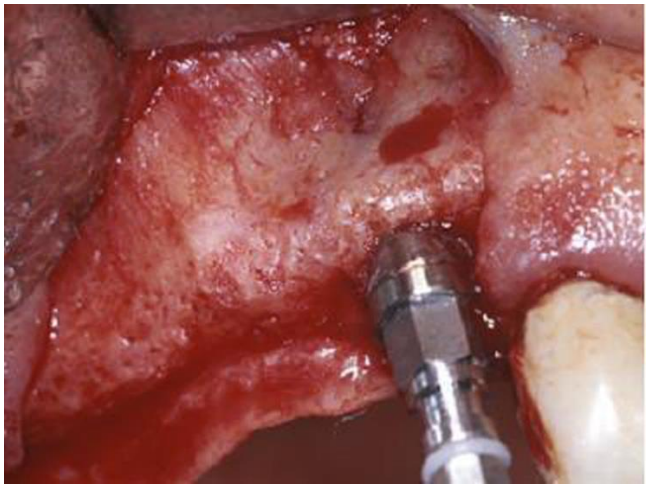

Figure 14.

Fenestration type of defect covered by a sheet of bone

RESULTS AND DISCUSSION

One hundred and thirty-five exposed implant surfaces were augmented with autogenous bone, harvested by scalpel technique. The survival rate of these implants was 100%, with no significant clinical finding. Healing of the grafted implant surface was observed clinically at the time of the gingival former applications in two-stage implants (Figures 1–4).

In this study, the gingival former applications in two-stage implants were performed by using a punch, only crestal incision and crestal incision with flap elevation. Crestal incision with flap elevation in gingival former application was performed in a small sample (close to 10% of augmented cases) for ethical considerations. Therefore, healing of all the grafted implant surface could not be observed clinically.

There are several procedures for covering a bone defect around an implant, including barrier membranes with or without allogenous or autogenous materials.[7-12] These procedures are time consuming and may necessitate graft materials or membranes.

There are also some special instruments manufactured to harvest bone sheet. However, they need to be sharpened regularly and sterilized for every usage. Also, the bone graft obtained by shavers does not form suitable curvature to adapt to the implant surface.

In contrast, scalpel graft forms an ideal curve and this method is a very easy way of bone harvesting with no additional special instrument. This technique also eliminates the need for alloplastic material and membranes. Alloplastic or other forms of autogenous bone grafts distend the soft tissue and may necessitate wide flap preparation. However, excessive force application may break the blade in very dense cortical bone. This problem can be overcome by experience.

The procedure described here takes only a few minutes and there is no need for any other graft material or a second surgical site. This graft is in lamellar form so there is no need to use a barrier membrane and covers the whole defect when positioned reversely. It forms a curved shape similar to the implant surface, which is maintained easily as it is thin and adaptable to implant surface; therefore, soft tissue closure without any tension is possible.

In this study, although severe defects were limited [15 of them (11%)], there were no differences between size of the defect and implant survival. However, one must keep in mind that the follow-up period is on average 4 years, and implant survival should be evaluated in the long term.

CONCLUSION

The scalpel technique used in this clinical study is an easy, effective and reliable technique for the management of dehiscence or fenestration defects of dental implants.

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