ARTIFICIAL DERMIS GRAFT ON THE MANDIBLE LACKING PERIOSTEUM AFTER EXCISION OF AN OSSIFYING FIBROMA: A CASE REPORT

Chun-Ming Chen, Yee-Shyong Shen, Chia-Fu Yang, Tien-Yu Shieh, Chung-Ho Chen, and I-Yueh Huang
Department of Oral and Maxillofacial Surgery, Kaohsiung Medical University Hospital, and College of Dental Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan.

Collagen-based grafts have often been used as artificial tissue substitutes for the repair of tissue and organ defects. It is common surgical knowledge that autogenous or artificial skin grafts take well on the intact periosteum of bone. However, many experienced surgeons indicate that autogenous or artificial skin grafts subsist poorly on the bone surface without periosteum. Therefore, primary closure is usually recommended in the wound healing of exposed bone. Vestibuloplasty might be needed to create enough depth of vestibule in the future. In this case report, we describe a peripheral ossifying fibroma surgically excised leaving a bony defect, which was covered by a piece of artificial dermis. Satisfactory result of the repaired surgical defect showed no need of vestibuloplasty after 6 years of follow-up.

Key Words: artificial dermis, lacking periosteum, peripheral ossifying fibroma

Ossifying fibroma is a slow-growing, asymptomatic, and benign fibro-osseous lesion of the jaw. It is most commonly seen in the third and fourth decades of life, with a female predilection [1], and 70–80% of cases occur in the premolar and molar area of the mandible [2–4]. Several rare cases involving large areas of the nasal bones, orbit, ethmoid sinus, sphenoid sinus, maxillary sinus, occiput, temporal bone, and nasopharynx have also been reported [5]. Radiographically, ossifying fibroma is radiolucent with varying degrees of opacity, and sometimes has a sclerotic border. It shows a variable appearance depending on the maturation or the amount of calcification present.

Postoperatively, the exposed bony defect has a need for soft tissue repair. This small bony defect can be covered with adjacent tissue by primary closure.

In larger bare bone defects, there are frequent complications in grasping the adjacent tissue for repairing. The insufficient vestibular depth may leave problems in dental prosthetics and oral hygiene care. This report describes a case of ossifying fibroma in the mandible. An artificial dermis was used to repair the surgical defect and showed the advantage of avoiding the vestibular insufficiency.

CASE PRESENTATION

A 24-year-old male was referred to our department for evaluation of soft tissue mass in the right side of the gingiva in the mandible. The patient stated that the lesion had been present for approximately 2 years, and had slowly enlarged after extraction of the right lower first molar. However, he was unaware that a residual root had been left in the extraction site. Except for occasionally interfering with mastication, the lesion was essentially asymptomatic. Intraoral examination revealed a nodular mass of tissue occupying the gingiva at the premolar and molar area of the
right mandible. It was pink, firm, pedunculated, with an ulcerative surface (Figure 1). The tumor measured approximately 25 mm in mesiodistal dimension, 15 mm buccolingually, and 10 mm occlusogingivally. A panoramic radiograph showed a well-defined radiolucent lesion containing some radio-opaque focus with a residual root of the first molar (Figure 2). Computed tomography (CT) disclosed a low-bone-density-like mass within the scant soft tissue component (Figure 3). CT also revealed the origin of the mass at the extraction site of the right lower first molar. The buccal and lingual cortices were expanded and perforated at the site of tooth extraction. Under local anesthesia, the pathologic report with incision biopsy indicated an ossifying fibroma. Surgical resection of the tumor was suggested and planned for the patient.

Under general anesthesia, the tumor and the overlying mucosa were excised down to the base along with the extraction of the second premolar. The residual bony base was trimmed to leave a 25×10 mm exposed bony defect. The surgical defect was covered with an artificial dermis graft (Terudermis™; Terumo Corp., Tokyo, Japan) (Figure 4). The artificial dermis was cut to fit the dimensions of the exposed area and sutured with the mucous border. A resin plate was used to immobilize the artificial graft and to keep close contact with the host bone. The pathologic report diagnosed the specimen as an ossifying fibroma. Microscopically, there was a prominent area of highly cellular fibrous connective tissue containing foci of woven bone, osteoid and amorphous calcifications.

---

**Figure 1.** Painless swelling mass in the right mandibular premolar and molar area.

**Figure 2.** Radiograph shows irregular radiolucent area with residual roots of the right mandibular first molar.

**Figure 3.** Computed tomography shows low-bone-density mass within the scant soft tissue component.

**Figure 4.** After excision of the peripheral odontogenic fibroma and bone trimming, the surgical defect was repaired with artificial dermis graft.
The resin plate was smoothly removed on the 10th postoperative day. When the silicone layer of the artificial graft was removed, the surface of the alveolar bone was totally covered by regenerated granulation tissue. One month after the operation, the granulation tissue was completely epithelialized with little contraction. After 6 years of follow-up, there was no visual or radiographic evidence of recurrence of the tumor and vestibular morphology looked satisfactory (Figure 5).

**DISCUSSION**

Treatment of ossifying fibroma is most often accomplished by surgical removal utilizing curettage, enucleation, or excision. Even though the teeth may be unaffected, there can be migration and loosening of adjacent teeth by tumor invasion. Therefore, the adjacent involved teeth of poor prognosis should be extracted to eliminate any possible tumor remnants. Overall, the prognosis is good and recurrence rate is considered low. However, Eversole et al [2] reported a recurrence rate as high as 28% following surgical curettage of these lesions. If this happens, complete excision becomes necessary. A variant of ossifying fibroma, the juvenile ossifying fibroma, has been described in children and teenagers. This rare lesion behaves in a more aggressive fashion than the ossifying fibroma, and may require more extensive therapy when encountered [1].

Healing of exposed bone by secondary intention may involve several weeks and cause more wound contraction and scar formation. Collagen products have often been utilized as major components of artificial tissue substitutes, which have to be biocompatible and biodegradable, after the damaged tissue has regenerated and healed. Recently, artificial collagen grafts have been used in the repair of soft tissue defects or burn wounds, as temporary skin substitutes. Nevertheless, it has been reported that the survival of autogenous skin grafts on bone lacking periosteum has been poor. Stallings et al [6] found a 22% average skin graft attachment to bare bone compared with a 77% attachment on bone with periosteum. It was considered that the intact vascularized bed is a crucial requirement in ensuring the success of the autogenous skin graft.

Terudermis™ (Terumo Corp.) is a bilayer artificial graft, which comprises an outer layer of silicone and an inner spongy layer of collagen. The bilayer artificial skin consists of a complex of collagen and chondroitin sulfate (glucosaminoglycans). Its antigenicity has been modified in order to reduce the inflammatory response and increase cellular affinity. Osaki et al [7] presented the histologic evidence to demonstrate the advantage of applying artificial collagen sponge (Terudermis™) on experimental dermoperiosteal scalp defects in rabbits. Microscopically, many cells, mainly fibroblasts and capillary vessels, invaded the collagenous implant migrating from the adjacent healthy dermis and the edge of the periosteal wound during healing. These results confirmed clinically that Terudermis™ is effective for the treatment of deep dermoperiosteal defects, in which skin regeneration rarely takes place with conventional therapy such as split-thickness skin grafts. In order to avoid the occurrence of postoperative shallow vestibular depth, Terudermis™ was applied as mentioned in this case report. We found that the postoperative course was unremarkable and the repair was effective on bare bone. During 6 years of postoperative follow-up, the vestibular depth was enough for dental prosthetics and oral hygiene was easy to maintain. This report described a solution for the surgical repair of a bare bony defect after tumor resection in the jaws.

**REFERENCES**

人工真皮應用在切除下顎骨周邊性骨化纖維瘤後缺乏骨膜的重建—病例報告

陳俊明 沈也雄 劉家福 謝天渝
許中和 黃逸岳
高雄醫學大學附設醫院 口腔顱面外科
高雄醫學大學 口腔醫學院

膠原組織是臨床上經常用來修補受損組織的一種人工替代物，在手術概念上，有完整骨膜的存在的區域，不管是自體或人造皮膚移植片，都可以成功地覆蓋。然而，多數有經驗的外科醫師都指出，不管是自體或人造皮膚移植片，覆蓋在缺乏骨膜的骨頭上，其效果都很差，因此在口腔環境下，利用皮瓣完全地覆蓋骨頭，是常常被建議的縫合方式，但卻會使病人在術後口腔前庭變淺，而且將來仍需利前庭成形術，以便得到足夠的口腔前庭深度。本次病例報告是一位周邊性骨化纖維瘤的病人，在切除腫瘤之後，在骨頭暴露的地方，利用人工真皮來修補，經過術後六年的追蹤，腫瘤沒有復發的現像，口腔前庭深度令人滿意，不需要進一步的成形術。

關鍵詞：人工真皮，缺乏骨膜，周邊性骨化纖維瘤

(高雄醫誌 2007;23:361－5)