Clinical Experience Using A Combination of PGA Sheet and Spraying of Fibrin Glue to Cover Partial Resection of Tongue Carcinoma

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SUMMARY

We encountered a case in which a combination of PGA sheet and spraying of fibrin glue was used to cover the part of the cut surface after resection of tongue carcinoma.

A 59-year-old woman was admitted to our department with a chief complaint of a white patch on the tongue. Partial resection of the tongue was performed. After resection of the lesion, some fibrinogen solution was rubbed on the surface of the wound and PGA sheet was placed over the wound. Three months after surgery wound was also completely epithelialized. Postoperative wound contraction of the scar was slight and the form of the tongue was relatively maintained. This method of a combination of PGA sheet and spraying of fibrin glue is considered to be useful for maintaining QOL of the patients after partial resection of tongue depending on the extent of resection of the tongue.

KEY WORDS
polyglycolic acid sheet (PGA), fibrin glue, tongue carcinoma

Introduction

In cases undergoing partial resection of soft tissue due to oral cancer of the tongue or other sites reduced suture, free skin grafting, DP flap and forearm flap have mainly been selected considering the postoperative quality of life (QOL). Recently a combination of polyglycolic acid sheet (PGA) and spraying of fibrin glue has been applied as sealants during thoracic surgery in order to prevent leakage following pulmonary resection, for dural repair during orthopedic surgery and for hemostasis repair during liver surgery1-12). Currently this method is also being tried to use for repair after resection of oral tumors.

We encountered a case in which a combination of PGA sheet and spraying of fibrin glue was used to cover part of the cut surface after resection of tongue carcinoma. We report a summary of the case and discuss the usefulness of this method.

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Case report

A 59-year-old woman was admitted to our department with a chief complaint of a white patch on the tongue in November, 2009. She noticed the white region on the left margin of the tongue four years earlier but it had disappeared immediately thereafter. The white region appeared again and the patient was referred to our department by her family dental clinic for further medical examination and treatment. She had a medical history of hypothyroidism and hyperlipidemia.

Intraoral findings at the first examination in our department demonstrated a superficial white and rough lesion measuring 11×8mm with a sharply demarcated margin at the inferior part of the left margin of the tongue. Behind the lesion, there was another lesion measuring 7×5mm similar to leukoplakia with an unclear marginal border (Fig.1).

Cytology examination demonstrated class IV findings in the white spot on the inferior part and class III findings in the posterior white part on the left side of tongue. There was an unstained portion near the iodine stained part toward the floor. The lesion was diagnosed as tongue carcinoma clinically. In December, partial resection of the tongue was performed with a 10mm safety margin beyond the unstained area. After resec-

Fig.1 Intraoral view before treatment. There were white and rough lesions.
tion of the lesion, complete hemostasis was achieved. Some fibrinogen solution was rubbed on the surface of the wound and PGA sheet was placed over the wound (Fig. 2). Then the fibrinogen-thrombin solution was sprayed over the PGA sheet. The operation was finished after confirmation of strong adhesion of the sheet to the wound.

The histopathologic findings showed that the proliferated cells had oval nuclei of various sizes, increased chromatin and eosinophilic cytoplasm and these cells all or half of the epithelium from the basal layer. Some basal portions between the basal layer and dermis were unclear and microinvasion of the proliferated cells into the dermis was observed (Fig. 3). Mild dysplasia was observed around the lesion and there was no dysplasia in the stumps. Histopathologic diagnosis was squamous cell carcinoma of tongue. Epithelialization started from the edges of the wound one week after surgery (Fig. 4) and three weeks after surgery, the entire PGA sheet had peeled away (Fig. 5). Two months after surgery, the surrounding tissue except central part showed almost normal tissue color and epithelialization had been achieved. Three months after surgery the central part was also completely epithelialized (Fig. 6). Postoperative wound contraction of the scar was slight and the form of the tongue was relatively maintained.

Discussion

This method of using a combination of PGA sheet and spraying fibrin glue has mainly been used for thoracic surgery as a sealant to prevent air leak after resection of lung parenchyma and also for liver surgery to prevent bile leakage after hepatic resection. Fibrin glue has traditionally been used most frequently because of the effect on the physiological mechanisms of wound healing and its usefulness has been reported.

We used a fibrin glue (The Bolheat, Teijin, Osaka, Japan) composed of fluid A, a fibrinogen preparation, and fluid B, a thrombin preparation. The two atomized fluids of fibrinogen preparation and thrombin preparation adhere firmly to the wound equally fast. The composition, when mixed at the site, undergoes instant fibrinogenesis with immediate tissue adhesion. The PGA sheet we used was Neovelt (Gunze, Kyoto, Japan) and it has been used as an artificial fiber cloth reinforcement for missing organs and the composition is polyglycolic acid. The texture of the sheet is rough, making it able to bond with the sprayed fibrin and strengthen its adherence to the wound.

The surgical procedures are described below. First, 0.3 ml of A solution liquid fibrinogen is rubbed with a finger on the wound surface and PGA sheet is placed over the wound. Then A and B fibrin solutions are sprayed on the sheet at the same time using the executive double tube structure syringe. In this procedure, a PGA sheet soaked in A solution and the fibrin solution combining the with A and B solutions react and make the wound surface covered with PGA sheet firm and smooth. The PGA sheet is normally absorbable, but after surgery, the PGA sheet was near the center of the wound in our case. Wound healing started from around the edges of the wound and the PGA sheet peeled off at the epithelialized portion. The peeling parts of the sheet were cut off appropriately. Azato, et al. reported about the combination of PGA sheet and fictional spraying of fibrin glue for head and neck surgery at the annual meetings of Japanese Society for Head and Neck Cancer in 2009 and 2010. According to them, the time until loss of the PGA sheet ranges from 0 to 57 days, and the average is 22.4 days. In the present case, the sheet dropped off on 21st day. They also reported that there were three early dropout cases in which the sheets dropped out within 1 week and postoperative bleeding occurred in three of 42 cases. In the cases of tongue resection, patients did not feel pain and required few NSAIDS as pain killers. Pain relief and hemostatic effects may be achieved by firm attachment of the sheet to the wound and reduction of edema and accumulation of exudate. This method, therefore, contributes to hemostatic effect and pain control. In addition, there were no adverse events or side effects of this method. There have not been significant abnormal variations detected on the general laboratory examinations and the safety of this method seems to have been confirmed in the field of thoracic surgery, liver surgery and orthopedic surgery. In cases that do not require extensive of tongue resection, postoperative wound contraction of the scar is slight and the form of the tongue will be relatively maintained. This method of a combination of PGA sheet and spraying of fibrin glue is considered to

![Fig.2 PGA sheet was placed over the wound and the fibrinogen-thrombin solution was sprayed over the sheet. The surface of the wound was bluish.](image)

![Fig.3 Histopathologic findings showed invasion of the proliferated cells into the dermis was observed. (H-E × 100)](image)
be useful for maintaining QOL of the patients after partial resection of tongue depending on the extent of tongue resection.

Reference

7) Hayashibe A.; The clinical research for prevention of bile leakage and pancreatic leakage occurred from cut surface of remnant liver and pancreas; the usefulness of fibrin glue and polyglycol acid felt as topical sealant. Surgery, 69:1154, 2007.

