

Case Report

Aesthetic pectoral muscle flap repair for refractory enterocutaneous fistula after salvage esophagectomy in a female patient

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Anastomotic leakage is a severe complication of esophagectomy. Development of an enterocutaneous fistula after anastomotic leakage often occurs after subcutaneous-route reconstruction at esophagectomy. Pectoralis myocutaneous flap (PMCF) repair has recently been performed when an enterocutaneous fistula was refractory to conservative treatment. However, this procedure requires a conspicuous incision and results in deformity of the breast especially in female patient. We performed pectoralis muscle flap (PMF) repair for a 50-year-old woman with a refractory enterocutaneous fistula after salvage esophagectomy. We made an oblique incision along the inframammary crease in order to avoid a conspicuous scar and moved the PMF under the mammary gland to the site of anastomosis. This method was effective for repairing a refractory enterocutaneous fistula, with especially good aesthetic results in a female patient.

ACTA MEDICA NAGASAKIENSIA 64: 61–63, 2020

Key words: esophagectomy, enterocutaneous fistula, pectoralis muscle flap repair

Introduction

Anastomotic leakage after esophagectomy can lead to severe mediastinitis. To avoid such a situation, the subcutaneous route for reconstruction is selected in salvage surgery or patients with severe comorbidities. However, once anastomotic leakage occurs in this route, it can readily progress to a refractory enterocutaneous fistula because of the tension due to the long distance of elevation and the lack of soft tissues locally [1, 2, 3].

The surgical procedure for treating refractory enterocutaneous fistula involves reinforcement to re-approximation, and reinforcement with a skin graft and muscle flap has been reported. However, these procedures result in additional conspicuous scarring for harvesting the skin graft.

We herein report a pectoralis muscle flap (PMF) for refractory enterocutaneous fistula treatment after salvage esophagectomy without the need for skin graft harvest in a female patient that achieved good aesthetic results.

Case Report

A 50-year-old woman received chemoradiotherapy at an affiliated hospital for esophageal squamous cell cancer. The tumor was located in the lower part of the esophagus and pretreatment diagnosis was cT1b(SM)N0M0 cStage I according to Japanese Classification of Esophageal Cancer[4]. Five months after the initial treatment, recurrence developed at the primary site in the esophagus, and she was referred to our

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Received May 18, 2020; Accepted June 14, 2020

hospital for additional radical treatment. As a medical checkup revealed a body mass index of 33.4 kg/m² and type 2 diabetes requiring intensive control, we performed thoracoscopic esophagectomy and reconstruction with a gastric conduit via the subcutaneous route. Three days after the surgery, subcutaneous abscess formation around the anastomosis of the neck developed. Although appropriate drainage, nutritional support and antibiotics brought the subcutaneous abscess under good control, a consequent refractory enterocutaneous fistula developed. The diameter of the fistula was about 2 cm. After repeated failure of endoscopic clipping and direct suturing, we planned to repair the fistula using a muscle flap with a skin paddle (myocutaneous flap) to cover the leakage site. However, the patient rejected this suggestion because the skin paddle would result in additional scarring in her breast.

After waiting for the fistula to become as small as possible through subcutaneous drainage, we performed a pectoralis muscle flap (PMF) for reinforcement of re-approximation 121 days after the primary operation.

Surgical procedure: A spindle shaped incision that included the enterocutaneous fistula was made in the neck to the precordial area, and inflamed skin around the fistula was removed. The fistula at that time was about 5 mm. After debridement, we re-approximated the vulnerable fistula with sutures as far as possible. For pectoralis muscle flap (PMF) creation, an oblique incision was made along the left inframammary crease from the axilla to the inferior portion of the breast (Fig. 1). After dissection around the muscle, we created an infra-mammary gland tunnel connecting to the neck wound, with enough width to allow the passage of the

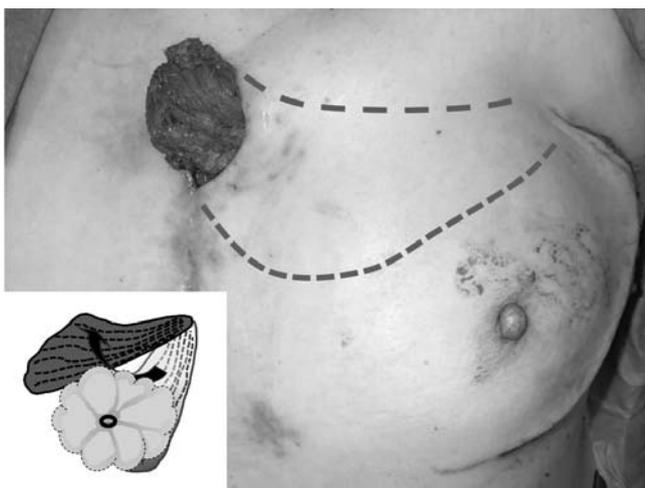


Figure 1. Repair of the fistula. An oblique incision was made along the inframammary crease from the left axilla to the inferior portion of the breast to expose the pectoralis muscle. The dotted lines and inset diagram show the position of the tunnel created for the pectoral flap.

flap in order to avoid vascular insufficiency. After resection of the sternal side of the muscle bundle, we brought the muscle flap up to the level of the clavicle while preserving its blood supply via the thoracoacromial artery and vein. The re-approximated site was then covered with the muscle flap. Next, we transplanted a split-thickness skin graft harvested from the left lower abdomen on the pectoralis muscle flap.

In the postoperative course, she began to take oral feeding 39 days after the second operation, and there was no passage obstacle and she ate normal food. She was discharged from the hospital without any problems. There has been no recurrence for two years since the initial surgery, and a good cosmetic outcome of the breast was achieved (Fig. 2).



Figure 2. Cosmetic outcome. The cosmetic outcome remains good two years after surgery, with no deformity in the left breast or conspicuous scarring of the chest.

Discussion

Surgical intervention should be considered if a refractory enterocutaneous fistula forms despite appropriate conservative treatment. However, repair of the fistula is difficult because of the inability to mobilize wound edges for tension-free closure, the nonviable tissue at the leak site, and poor soft tissue of the repair site. The pectoralis myocutaneous flap (PMCF) to reinforce repair sites, such as sites of refractory anastomotic leakage, has been reported [5, 6]. This flap consists of a skin paddle to cover an anastomosis and a muscle flap to feed the paddle and reinforce the anastomosis. Therefore, an incision from the acromion to the xiphoid is needed in order to preserve the major blood supply from the thoracoacromial artery [3]. For harvesting skin paddles, incisions at the superior and medial quadrant area of the

breast are needed, which is fed by perforating artery from the thoracoacromial artery [7].

Morita et al. reported six patients who were treated for anastomotic leakage using a PMCF [3]. The authors recommended this method for repairing refractory anastomotic leakage after reconstruction via the subcutaneous route for esophageal cancer. However, in women, multiple incisions are cosmetically undesirable.

We performed a PMF without a skin graft in a woman with a refractory enterocutaneous fistula. These flaps are often used to fill in defects of the anterior chest wall, and to manage clinically problematic postoperative deep sternal wound infection [8]. Gil et al. further reported the usefulness of a PMF for reinforcing the anastomosis after salvage total laryngectomy [9]. Although the reinforcement with PMF seems less reliable than that with PMCF, it was successful for our patient: there was no re-anastomotic leakage and stenosis. We speculated that one of the reasons of this is that the fistula could get as smaller as to be covered with PMF through long-term patient conservative treatment even if complete closure of the fistula would not be expected.

In addition, PMF can allow surgeons to design the incision freely, as long as the blood supply of the muscle flap is maintained, and thereby avoid skin defects and breast deformity due to skin graft harvest. In the present case, an oblique incision was made along the inframammary crease, and the PMF was elevated under the mammary gland route into the neck re-approximated site. This procedure made the scar inconspicuous and avoided causing any breast deformity.

Conclusion

This procedure was feasible for repairing a refractory enterocutaneous fistula and maintaining the cosmetic appearance of the breast in a female patient. It may be a good alternative repair method for other patients with cosmetic concerns.

Consent for publication

Written informed consent was obtained from the patient for the publication of this case report and any accompanying images.

Conflict of interest

The authors declare that they have no conflicts of interest.

Funding

None.

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