Dermatofibrosarcoma protuberans (DFSP) is a slow-growing malignant skin tumor that rarely metastasizes but is locally invasive and is likely to recur even after wide excision. Accordingly, a split-thickness skin graft (STSG) is usually recommended for reconstruction after resection of the tumor. In this report, we present a case of giant DFSP in the groin region of young woman. Reconstruction of large groin defect after DFSP resection was performed by “split-skin paddle anterolateral thigh flap” instead of skin graft considering that the patient was a 29-year-old woman. This method enabled the primary closure of the donor site and provided the positive functional and esthetic outcomes. In the present case, the surgical scar is less conspicuous and the patient can climb and descend stairs without any trouble at 4 years after the surgery. With careful monitoring of the tumor recurrence, this technique may become a reliable reconstruction option for patients with large groin defect after resection of the malignant tumor. (Plast Reconstr Surg Glob Open 2019;7:e2528; doi: 10.1097/GOX.0000000000002528; Published online 12 December 2019.)

CASE REPORT

A 29-year-old woman presented with a long-standing history of a painless mass in her right groin. The mass, which was a tiny pink-colored nodule with pigmentation when the patient was aged 15 years, continued to enlarge as it occupied the majority of her right groin.

Upon initially visiting our hospital, 3 domal masses (7.4, 4.6, and 5.6 cm) were linearly located above the inguinal ligament. The lateral mass took on a multinodular pattern, whereas the medial mass produced purulent effusion with overlying skin necrosis (Fig. 1).

Contrast-enhanced magnetic resonance imaging demonstrated a heterogeneous increase in the signal intensity of the tumor, which infiltrated all the layers of the subcutaneous adipose tissue.

Following skin biopsy, the patient was diagnosed with DFSP. Positron emission tomography/computed tomography revealed no obvious metastasis.

Following skin biopsy, the patient was diagnosed with DFSP. Positron emission tomography/computed tomography revealed no obvious metastasis.

Following the pathologic diagnosis, wide tumor resection was subsequently performed. Three-centimeter margin from the edge of the mass and surrounding pigmentation was obtained. Superficial and deep inguinal lymph nodes were dissected for regional node sampling. The tumor was resected with a 3-cm margin from the lateral, medial, and superior borders. The defect was reconstructed with a split-skin paddle anterolateral thigh flap. The donor site was closed primarily.

After surgery, the patient was followed up every 6 months for 3 years. No evidence of recurrence or metastasis was found. At 4 years after the surgery, the patient could climb and descend stairs without any trouble. She could walk and run without any function loss. The surgical scar was less conspicuous, and she could wear a regular skirt and underwear (Fig. 2).

Fig. 1. A 29-year-old woman presented with enlarging domal groin masses.
were also dissected with the tumor because the mass was located immediately above the dissected nodes.

To minimize the defects, the wound ends were sutured as much as possible, whereas the sartorius muscle was transferred over the exposed femoral artery and vein. The remaining defect, 26 cm × 15 cm in size, was covered by artificial dermis (Pelnac, Kyoto, Japan), and reconstruction was planned after the pathologic evaluation of the surgical margin (Fig. 2).

The pathologic diagnosis indicated DFSP, whereas tumor margins were assessed as all negative. Moreover, no inguinal lymph node metastasis was observed.

We planned to cover the defect using a split-skin paddle pedicled anterolateral thigh (ALT) flap from right thigh. Before the surgery, at least 2 separate cutaneous perforators of the descending branches of the lateral circumflex femoral artery (LCFA) were located using Doppler ultrasonography. The overall shape of the flap was designed to be vertically elongated to enable direct closure of the donor site, whereas 2 skin paddles were designed corresponding with the perforator entry points. Flap elevation was performed by identifying the perforating branches of the descending LCFA through intramuscular course. Tensor fasciae latae with ascending and transverse branches of LCFA was added to the ALT flap to increase the blood supply to the harvested flap. The flap was then divided between the 2 perforators. After harvesting this flap, the cranial donor site partially required STSG given the risk of pedicle compression during the primary closure of the entire donor site (Fig. 3).

No signs of local recurrence were present 4 years postoperatively by confirming magnetic resonance imaging scans on groin every 6 months. (Fig. 4). The patient can climb and descend stairs and go on smooth day-long walks without any trouble. She can also sit using the Japanese “Seiza” style (her feet tucked underneath her) and does not suffer from urinary problems despite the flap reconstruction adjacent to the perineal area.

**DISCUSSION**

The National Comprehensive Cancer Network Guidelines recommend the use of STSG for reconstruction after DFSP resection to monitor local recurrence. In the present case, however, we opted to utilize a pedicled flap for reconstruction after verifying negative histological margins considering the risk for restricting hip joint movement and spread of urinary stream because of the extensive scar contracture following STSG. Additionally,

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**Fig. 2.** Intraoperative appearance after resection of DFSP of the groin.

**Fig. 3.** Intraoperative appearances (left, flap design; right, split-skin Paddle flaps). The long vertical ALT flap was designed. Two skin paddles were split corresponding with the perforator entering points (white arrows) and transferred to the groin defect.
esthetic outcomes in both the recipient and donor sites had to be considered given that the patient was a young woman. We discussed these matters with the patient, and a split-skin paddle ALT flap was finally chosen. Rectus abdominis myocutaneous or perforator flap was also considered as another reconstructive option; however, for future childbearing, we avoided operation to her abdominal area. Although a few reports are available regarding flap reconstruction following DFSP resection,1 no report has considered both esthetic and functional consequences.

Split-skin paddle ALT flap was first reported by Marsh and Chana in 20102 and was subsequently termed the “kiss” flap and divided into 3 major styles and 5 different types according to the pattern of vascularization.3 The primary concept of this technique is to convert 2 long and narrow flaps into a single unified wide flap. This would allow the reconstruction of considerably large defects while maintaining direct linear closure of the donor site and minimizing its morbidity.4,5

DFSP itself is a slow-growing tumor and usually exhibits a single nodular pattern. In the present case, however, the patient did not visit any medical institution for 13 years because she hesitated to reveal her condition to other individuals. There have been several case reports regarding “giant” DFSPs. To the best of our knowledge, the largest DFSP was 25 cm × 27 cm × 18 cm in size on the upper back of a 63-year-old man.6 Nonetheless, none of the studies have involved a young woman such as the 1 in the present case.

Lymph node resection was another issue that required consideration. In the present case, resection included the tumor and inguinal lymph nodes to obtain a safe surgical margin. Lymph node metastasis of DFSP has been quite rare,7,8 with even the present case showing no metastasis despite the large tumor, early onset, and tumor location immediately above the lymph node. Therefore, lymph node dissection should be considered only when evident regional lymph node swelling is present and/or a high probability of metastasis is determined after imaging study.8,9

CONCLUSIONS

We herein reported a case of a giant DFSP in the groin region of a young woman. Reconstruction of the large groin defect through a split-skin paddle ALT flap showed positive esthetic and functional outcomes in both the recipient and donor sites. Nonetheless, STSG remains the generally recommended reconstruction method following DFSP resection. Accordingly, skin flap reconstruction should be carefully planned according to the lesion and patient characteristics.

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