Annals of Plastic Surgery

The Combined Bipedicled Latissimus Dorsi and Groin Flap for Anterior Chest Wall Reconstruction: A Case Report.

--Manuscript Draft--

Manuscript Number:	
Full Title:	The Combined Bipedicled Latissimus Dorsi and Groin Flap for Anterior Chest Wall Reconstruction: A Case Report.
Article Type:	Reconstructive Surgery
Keywords:	Latissimus Dorsi Flap; Bipedicle; Pedicle flap; Groin flap; Microvascular anastomosis; Chest wall reconstruction; Rib reconstruction; phyllodes tumor; oncologic resection; Autologous rib; pedicle rib; Recurrent tumor; Thoracic chest wall reconstruction; Skin graft; myocutaneous flap.
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Manuscript Region of Origin:	UNITED STATES
Abstract:	We provided a case report of a reconstruction of a massive chest wall defect after recurrent phyllodes tumor resection using a bipedicled groin and latissimus dorsi flap, with composite rib autologous reconstruction. The patient successfully recovered, and illustrated the applicability of this flap in the armamentarium of anterior chest wall reconstructive options.

Annals of Plastic Surgery Editorial Office

We are submitting an original article entitled, “The Combined Bipedicled Latissimus Dorsi and Groin Flap for Anterior Chest Wall Reconstruction: A Case Report.” to be considered for publication in *Annals of Plastic Surgery Journal*. This article demonstrates a unique case report of anterior chest wall reconstruction that minimizes operative resources needs and complications.

This represent an original case report, and is not under consideration for publication in any other scientific journal. The authors have no disclosures and all authors have reviewed and approved this manuscript for submission in your journal.

Thank you,

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Title

The Combined Bipedicled Latissimus Dorsi and Groin Flap for Anterior Chest Wall Reconstruction: A Case Report.

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The Combined Bipedicled Latissimus Dorsi and Groin Flap for Anterior Chest Wall Reconstruction: A Case Report.

Abstract:

We provided a case report of a reconstruction of a massive chest wall defect after recurrent phyllodes tumor resection using a bipedicled groin and latissimus dorsi flap, with composite rib autologous reconstruction. The patient successfully recovered, and illustrated the applicability of this flap in the armamentarium of anterior chest wall reconstructive options.

Introduction:

The combined latissimus dorsi myocutaneous flap and groin flap have been reported in the literature as a free flap (Harri et al 1981, Dzwierzynski et al 1995) and as a pedicled flap (Katsaros et al 1983). Because of the two axial vascular supplies, the flap is robust and can be used to cover large defect. In addition, vascularized ribs can be included as part of the flap for reconstruction of chest wall defect.

This combined chimeric flap can cover large anterior chest wall defect with no microvascular anastomosis, and causes low donor site morbidity.

Case:

The patient is a 43 y/o female who presented for chest wall reconstruction after recurrent phyllodes tumor recurrences. She presented 2 years earlier with a small breast mass that was found to be a

benign phyllodes tumor on lumpectomy. She then presents with a huge malignant phyllodes tumor with active bleeding, and involvement of the 4th to 6th ribs (Figure 1 and 2). No signs of metastatic disease were found on workup.

Operative details:

After wide local resection of the tumor and 4th- 6th ribs by the General and thoracic surgery team (specimen measured 38 x 28 x 35 cm in size and weighted 5.6 kg), there was a 6 x 8 cm pleural defect with exposed lungs, requiring rib reconstruction for stabilization and coverage, with skin flap as well as muscle (Figure 3.)

The latissimus flap is a musculocutaneous flap based on the thoracodorsal artery. Skin peddle could be included with the latissimus dorsi. The classic groin flap was first described by McGregor and Jackson (1972), and is based off the superficial circumflex iliac artery.

The combination of latissimus flap and groin flap was bipedicled based on these two sources of blood supply, the thoracodorsal artery and the superficial circumflex iliac artery. A longitudinal skin paddle of about 10-15 cm was marked connecting the origin of these two flaps.

The superficial circumflex artery was identified by palpating the inguinal ligament and the ASIS. The dissection was carried out toward the midline, where the sartorius origin was identified. The artery pierced the fascia of the sartorius at the medial edge. The dissection stops before reaching the medial fascia of the sartorius, decreasing risk of damaging the pedicle. Patient was then repositioned in the right decubitus position, and attention was directed toward the latissimus dorsi (LD) flap.

In this case, the anterior border of the flap on the chest was the posterior extend of tumor resection margin. The dissection was carried out in a subcutaneous manner posteriorly until the LD was reached, when the entire LD was separated from its inferior iliac crest and lumbar fibrous attachment, dissecting from distal to proximal. The thoracodorsal artery was traced to the origin and released to increase the arc of rotation, taking care to preserve the branch to the serratus and leaving the superior segment of serratus anterior in place to prevent scapular winging.

The perforator supplying the 9th rib was identified and the flap was dissected to incorporate the 9^{th} rib and lower 2 digitations of the left serratus anterior muscle, taking care not to damage the pleura.

The bipedicle flap was then mobilized anteriorly. The 9th rib was mobilized in an anterior-superior direction and fixed to the rib defect with wires. LD muscle was sutured to the edge of the pleura. The posterior and abdominal donor sites were skin grafted with meshed STSG from the left thighs.

Post Op:

Most skin grafts took well. There was 1 spot that did not heal and was skin grafted on subsequent follow-up. The bipedicled flap itself healed very well without areas of necrosis, and patient have no issues with breathing. Post operative photos (Figure 4). Post operative chest x-ray (Figure 5).

Discussion:

Many options for reconstruction of the anterior chest wall defect exist. With a large defect such as ours, a muscle flap is preferable. Given the large area of bony defect exceeding more than 3 ribs, a stable

structural support either with autologous rib or synthetic material such as various mesh products (PTFE, acellular dermal matrix, etc) are needed (Deschamps C. et al 1999; Hasse J et al 1991).

The local muscle flap options included pectoralis major, latissimus dorsi, serratus anterior, and rectus abdominis (Arnold et al, 1996). For our case, the majority of the pectoralis major was resected, making this a poor option. The contralateral pectoralis major would not reach the entire defect. The ipsilateral latissimus muscle alone is not bulky enough. In addition, the most crucial part of the defect will be cover by the tip of the traditional LD flap, making it prone to ischemia and breakdown. The rectus abdominis muscle was considered, but was also found to be deficient in volume in this patient, and the pedicle was unreliable as the extensive resection included the internal mammary artery and the 8th intercostal perforator (Mathes 1997). The omentum flap will not provide a stable construct.

Since Harri (1981) and later Katsaros (1983) introduced the combined latissimus dorsi musculocutaneous and groin flap, it has rarely been reported in the literature, likely due to the limited situation in which this is suitable. More esoteric flaps including a case report of a bilateral free TRAM flaps (Rand et al 1995), and free LD –groin flap transfer (Dzwierzynski et al 1995), have been described, but these requires prolonged operative time, microvascular anastomosis and its associated risks. Composite rib reconstructions have been described, including thoracodorsal artery perforator flap (Dast et al. 2012), and LD with rib pedicled flap (Hirase et al. 1991).

In our case, with the large anterior chest wall defect requiring rib reconstruction, this bipedicled flap in combination with the pedicled autologous rib provided an ideal solution with minimal surgical time and no requirement for microvascular anastomosis and its associated risks.

Furthermore, this flap allows the flexibility of dividing the groin flap and doing a microvascular anastomosis if the bipedicled method would not adequately cover the entire defect.

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Figure 1: Pre operative presentation of the massive phyllodes tumor

Figure 2: Pre operation CT scan show involvement of the rib

Figure 3: Intra operative findings of chest wall defect and bipedicle flap.

Figure 4: 3 months after her operation, the flap healed well and skin graft have taken.

Figure 5: Chest xray findings of the autologous rib reconstruction.

Figure 1

Figure 2

Figure 3

Click here to download Figure Figure 3 Chest wall defect and flap.JPG

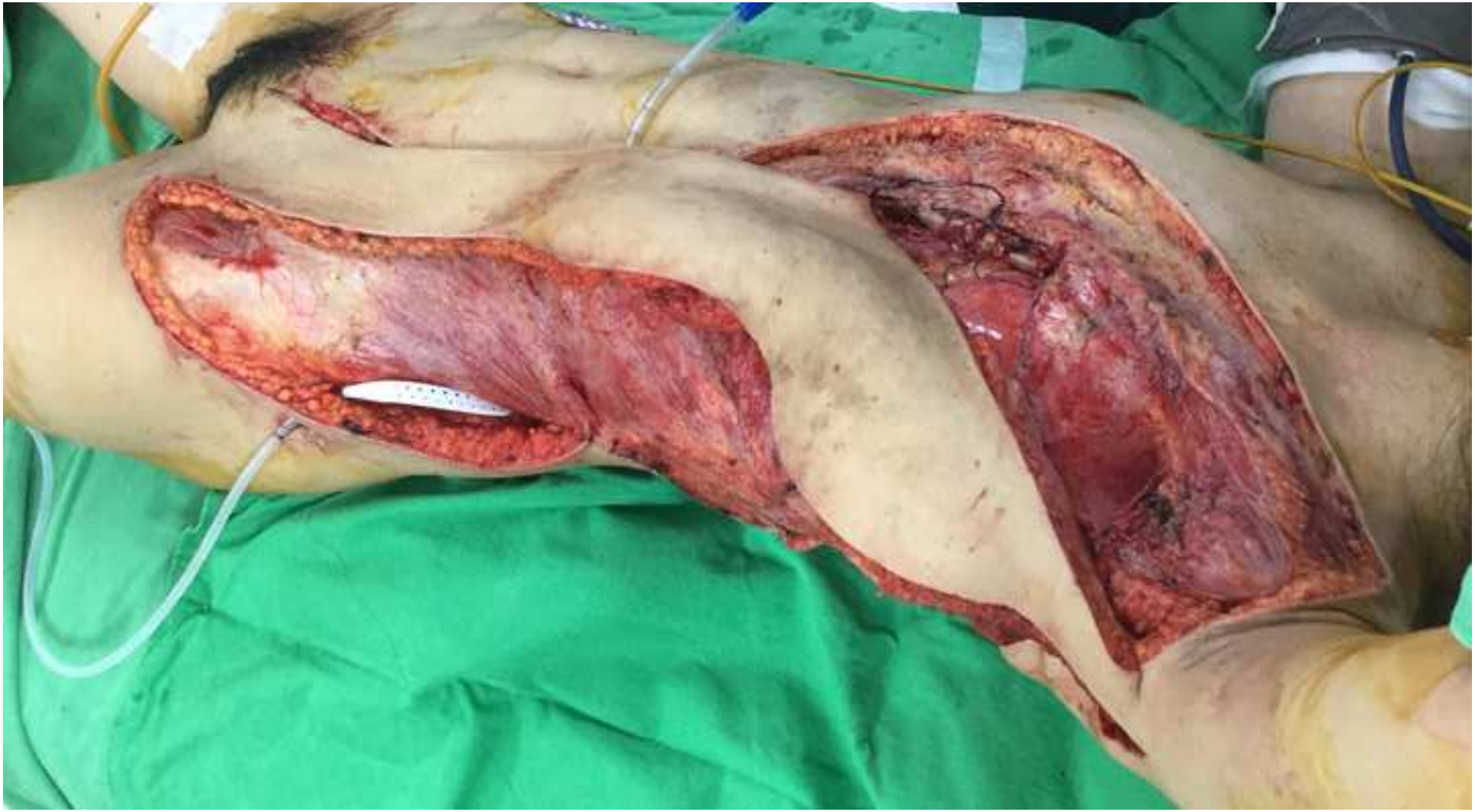

Figure 4

Click here to download Figure Figure 4 Final result.jpg

Figure 5

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