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(CASE REPORT)

Rhomboid flap reconstruction for a large thoracic lipoma: Challenges and outcomes within a maritime floating hospital setting

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Abstract

Objectives: To demonstrate the feasibility of performing local flap transposition for large soft-tissue defects in resource-limited maritime environments and to evaluate the clinical outcomes of a Limberg (Rhomboid) flap for reconstruction in high-tension anatomical areas.

Background: Lipomas are common benign mesenchymal tumors that are usually slow-growing and asymptomatic. However, lesions subjected to repeated friction or mechanical stress may present with bleeding and raise suspicion for vascular tumors or malignancy. In archipelagic regions such as Indonesia, geographical and economic barriers often limit access to specialized reconstructive care. Under these conditions, where advanced imaging is frequently unavailable, surgical decision-making relies largely on clinical assessment. The Rumah Sakit Kapal Ksatria Airlangga (RSKKA) functions as a floating hospital designed to provide surgical services to remote island populations.

Case Presentation: A 48-year-old woman from Sailus Island, South Sulawesi, presented with a 3-year history of a progressively enlarging posterior thoracic mass measuring 7.5 × 2.5 × 1.8 cm. Due to the high-tension location and anticipated defect size after excision, primary closure was considered inadequate. Wide excision followed by reconstruction with a Limberg (Rhomboid) flap was performed under portable shipboard lighting.

Results: Histopathological examination confirmed a 22 g lipoma. The flap achieved tension-free closure without complications.

Conclusions: Rhomboid flap reconstruction can be safely performed in austere maritime environments, highlighting the role of floating hospitals in improving access to reconstructive surgical care for remote populations.

Keywords Rhomboid Flap; Floating Hospital; Soft Tissue Reconstruction; Surgical Equity

1. Introduction

Lipomas are among the most common benign soft-tissue tumors originating from mature adipocytes and typically present as slow-growing, painless subcutaneous masses. They are most frequently located on the trunk, shoulders, and extremities and are usually discovered incidentally during physical examination [1]. Although most lipomas remain asymptomatic, lesions located in areas exposed to repeated friction or mechanical irritation may become symptomatic and occasionally raise concern for vascular tumors or malignancy, making surgical excision and histopathological evaluation necessary [1,2].

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The surgical management of large lipomas in high-tension anatomical regions, such as the posterior thorax, may present reconstructive challenges. Primary closure following excision can generate significant tension across the wound edges, increasing the risk of wound dehiscence, ischemia, and poor cosmetic outcomes. In these situations, local flap techniques are often preferred. Among these, the Limberg (rhomboid) flap is widely recognized as a reliable reconstructive option because it redistributes tension and recruits adjacent tissue with a dependable vascular supply [3,4].

Providing surgical care in remote archipelagic regions presents additional challenges. In many low-resource settings, access to advanced imaging, specialized surgical facilities, and postoperative care remains limited. Global surgery initiatives have emphasized the importance of improving access to essential surgical services for populations living in geographically isolated areas [5]. Floating hospitals represent an innovative approach to addressing this gap by delivering surgical care directly to underserved island communities. The Rumah Sakit Kapal Ksatria Airlangga (RSKKA) functions as a mobile surgical platform designed to provide medical and surgical services to remote populations across the Indonesian archipelago.

This report describes the management of a large thoracic lipoma using rhomboid flap reconstruction performed aboard a maritime floating hospital, highlighting both the technical considerations and the broader role of mobile surgical missions in improving access to reconstructive care.

2. Case Presentation

A 48-year-old woman residing on Sailus Island, South Sulawesi, presented with a three-year history of a progressively enlarging mass on the posterior thoracic region. Physical examination revealed a soft tissue lesion measuring approximately 7.5 × 2.5 × 1.8 cm (Figure 1). The patient reported intermittent bleeding and irritation caused by repeated friction from clothing and daily activities. Associated symptoms such as cough or respiratory complaints and reported only localized pain at the site of the mass.

Due to the remote island setting, access to advanced imaging modalities such as imaging was limited. As a result, surgical planning relied primarily on clinical examination. Considering the lesion size and anatomical location, primary closure following excision was expected to produce excessive tension.

Figure 1 Clinical appearance of a mass on the posterior thorax

The procedure was performed aboard the Rumah Sakit Kapal Ksatria Airlangga (RSKKA) (Figure 3) in its mobile operating suite. After standard sterile preparation, wide excision of the mass was performed under portable shipboard lighting using mobile surgical equipment. Because of the anticipated defect size and the high-tension characteristics of the posterior thoracic region, a Limberg (rhomboid) transposition flap was designed adjacent to the defect to allow tension-free closure (Figure 2).

Figure 2 Design and the postoperative appearance of the rhomboid flap

The rhomboid flap redistributes tension by recruiting skin from surrounding areas of relative laxity while maintaining a reliable random-pattern vascular supply The flap was carefully elevated and transposed into the primary defect, and the donor site was then closed primarily. Despite the constraints of the maritime.

We attempted to perform postoperative follow-up with the assistance of local healthcare personnel on the island. However, due to communication difficulties related to the remote geographical setting, the patient could not be contacted consistently. As a result, postoperative photographic documentation was not available.

The excised specimen was preserved and sent to the anatomical pathology for diagnostic evaluation once the vessel returned to Surabaya. Histopathological examination confirmed the lesion as a benign lipoma with no evidence of malignancy.

3. Discussion

Reconstruction of large soft-tissue defects in the posterior thoracic region can be challenging because of constant mechanical stress generated by trunk movement and rotation. When primary closure is attempted in high-tension areas, excessive strain at the wound margins may compromise tissue perfusion and increase the likelihood of wound complications such as dehiscence or delayed healing [6].

Local flap reconstruction techniques provide an effective method for addressing these defects. The Limberg (rhomboid) flap, originally described as a geometric transposition flap, has become widely used in reconstructive surgery due to its simplicity, versatility, and dependable blood supply [3]. Contemporary studies have shown that this flap can be successfully applied to reconstruct defects in various anatomical regions while providing favorable functional and aesthetic outcomes [4]. In addition, clinical comparisons have demonstrated that the Limberg flap is associated with lower complication rates compared with primary closure in procedures such as pilonidal sinus surgery [7].

Although most lipomas are confined to the subcutaneous tissue, deeper variants have been reported to extend into surrounding structures, including the intermuscular plane, pleura, or even the thoracic cavity in rare cases. When thoracic involvement occurs, patients may present with respiratory symptoms such as cough, dyspnea, or chest discomfort due to compression of adjacent structures [1,2]. For this reason, imaging modalities such as ultrasound, computed tomography, or chest radiography are often recommended to evaluate the extent of deeper soft-tissue tumors located on the thoracic wall.

However, in remote island settings such as Sailus Island, access to diagnostic imaging may be extremely limited. In the present case, no preoperative imaging, including chest radiography, could be performed due to the logistical constraints of the maritime mission. Clinical assessment therefore played a central role in preoperative decision-making. Importantly, the patient denied respiratory symptoms such as cough or shortness of breath and only reported localized pain at the site of the mass, suggesting that deeper thoracic involvement was unlikely. In such contexts, careful physical examination and clinical judgment remain essential for guiding surgical management when advanced diagnostic resources are unavailable.

Performing reconstructive procedures in maritime environments introduces additional logistical challenges. Surgical teams operating on floating hospitals must often rely on portable equipment and limited infrastructure, while also adapting to environmental instability caused by vessel movement. Maintaining sterile conditions and adequate operative lighting can therefore be more difficult than in conventional hospital settings.

Another important challenge in remote island healthcare is limited postoperative follow-up. Patients living in geographically isolated areas frequently face financial and logistical barriers when traveling to tertiary care facilities. Consequently, surgical teams must prioritize techniques that provide reliable outcomes and minimize the likelihood of complications requiring further intervention.

In this context, the rhomboid flap represents an appropriate reconstructive option because it is technically straightforward, provides reliable vascularity, and enables durable tension-free closure. The successful outcome of this case demonstrates that even complex reconstructive procedures can be safely performed in resource-limited maritime environments. Furthermore, floating hospitals represent an important component of global surgery initiatives aimed at expanding access to essential surgical services for underserved populations [5].

Figure 3 Hospital Ship (Rumah Sakit Kapal Ksatria Airlangga)

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

Statement of ethical approval

According to the ethical guidance for case reports provided by the Committee on Publication Ethics (COPE), institutional ethical review is generally not required for single or small case reports if does not involve prospective research protocols or experimental interventions. Therefore, formal institutional ethical approval was not required for this report.

Statement of informed consent

The authors confirm that written informed consent was obtained from all patients involved in this study. The patients provided permission for the use of their clinical information and images for publication purposes.

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