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Case Report

Transpositional and skin grafting following release of axillary contracture due to burn injury: a rare case report

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ABSTRACT

Burn injuries are among the most common causes of disability and mortality in children. One of the most frequent complications is post-burn contracture, which significantly impairs functional mobility and quality of life. Axillary contracture, in particular, poses a surgical challenge due to its impact on upper limb movement, making activities of daily living difficult for affected individuals. A 22-year-old male patient presented with a 15-year history of scald burn scar on his left axillary following a scald injury in childhood. The patient experienced restricted shoulder mobility, limiting his daily activities. Physical examination revealed a contracture involving the left axilla, lateral, and posterior thorax. Surgical release of the contracture was performed under general anesthesia using appropriate reconstructive techniques tailored to the defect. The procedure was successfully completed, and the patient was discharged in stable condition. Postoperative follow-up showed satisfactory wound healing and a marked improvement in shoulder mobility. Post-burn axillary contracture remains a major challenge, not only from a surgical standpoint but also because of its profound impact on a patient's independence and quality of life. Surgical release continues to be the cornerstone of treatment, offering a path toward restoring function and dignity that years of scarring may have taken away. From our experience, timely and well-planned reconstructive surgery can safely and effectively correct even severe contractures with both anterior and posterior involvement, including cases where definitive management has been delayed for many years.

Keywords: Axillary contracture, Multiple, Post-burn, Surgical management

INTRODUCTION

Burn injury is one of the most common accidental injuries causing disabilities and death in children. In Indonesia, burn injuries account for 195,000 deaths each year.[1] Scald burns are the most common type of burn in children, accounting for 72% of pediatric burns.[2,3] Contracture is the most common post-burn complication, resulting in significant functional impairment, restrictions in daily lives, and decreased quality of life for the affected individuals. Contracture is characterized by a limitation or loss in range of motion (ROM) or malalignment of anatomic structures.[4,5] Upper limb contracture constitutes a major case of contractures and can decrease the ability to perform activities of daily living such as eating, dressing, and bathing. For individuals with severe burns of the trunk and upper arm, axillary contracture remains a difficult surgical problem.[5,6] Axillary contracture can be classified using the Kurtzman and Stern classification, which can be divided into three categories.[7] Type 1A axillary contracture includes injuries involving the anterior

axillary fold, type 1B includes injuries involving the posterior axillary fold, type 2 includes injuries involving both anterior and posterior axillary folds (sparing axillary dome), and type 3 axillary contractures include injuries type 2 plus axillary dome.[4] Post-burn contracture incidence ranges between 18% to 50% and is associated with delayed wound healing.[7,8] Surgical procedure is the best treatment option for post-burn contracture. Indication for reconstructive surgery after burn injuries is for problematic scar development that requires a surgical intervention to relieve the scar-related morbidity.[9]

The fundamental approach of contracture release surgery is to release or remove the scar and replace the defect with donor tissues. There are various techniques for contracture reconstruction, including skin grafts and multiple flaps.[10] However, there is no consensus on the recommended management of contracture. One commonly used technique is the transpositional flap, which is a reconstructive method involving the transfer of skin tissue along with its vascular supply to an adjacent defect area, while a skin graft is the transplantation of skin from a donor to a recipient site without its own blood supply, with both procedures being applied according to indication for wound recontruction.[11-13] This case report presents a 22-year-old man with post-burn axillary contracture surgery after fifteen years.

CASE REPORT

A 22-year-old male patient presented to the plastic surgery outpatient clinic with complaints of a wound in the left axilla that had persisted for 15 years, causing discomfort and impairing daily activities. The wound resulted from a scald injury caused by hot water spilling over the left axilla, posterior, and lateral thorax of the patient when he was 7 years old. The patient had not sought medical attention earlier due to financial constraints. The current symptoms include limitation of movement on the left upper arm. There is no history of systemic diseases such as diabetes mellitus, hypertension, and other comorbidities.

Figure 1 (A-E): Clinical pictures of the patient.

On the pre-operative physical examinations, the patient appeared compos mentis, mildly ill. His vital signs were as follows: body temperature of 36°C, blood pressure of 120/70 mmHg, heart rate of 82 beats per minute, respiratory rate of 20 breaths per minute, and oxygen saturation of 99% on room air. There is no abnormality in the cardiac, and lung examination. Local examination revealed a contracture of skin in the left axilla, lateral, and posterior thorax that can be seen in Figure 1.

The patient was diagnosed with left axillary contracture. Release contracture surgery was planned for this patient at the left axilla region. The patient was positioned in a supine position under general anesthesia. Following disinfection of the surgical area, a sterile drape with an opening was applied. An incision was made according to the preoperative design in the axillary region, followed by transpositional flap and skin graft techniques, which were deepened as necessary. Haemostasis was carefully controlled, and the surgical wound was closed using 3.0 absorbable multifilament sutures for the deeper layers, while the cutaneous layer was sutured with 4.0 monofilament sutures. The wound was then covered with tulle gauze and dry sterile gauze. The procedure was completed successfully. After the procedure, the patient was then admitted to the general ward.

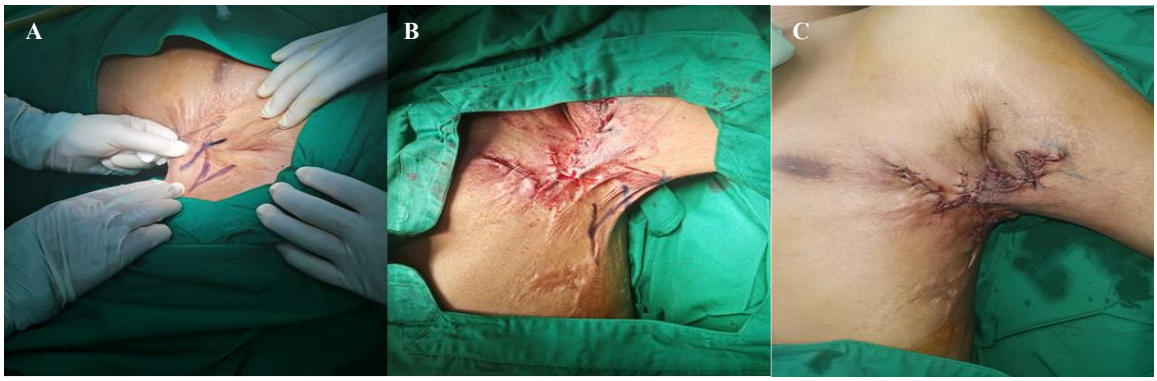

Figure 2 (A-C): Durante op pictures.

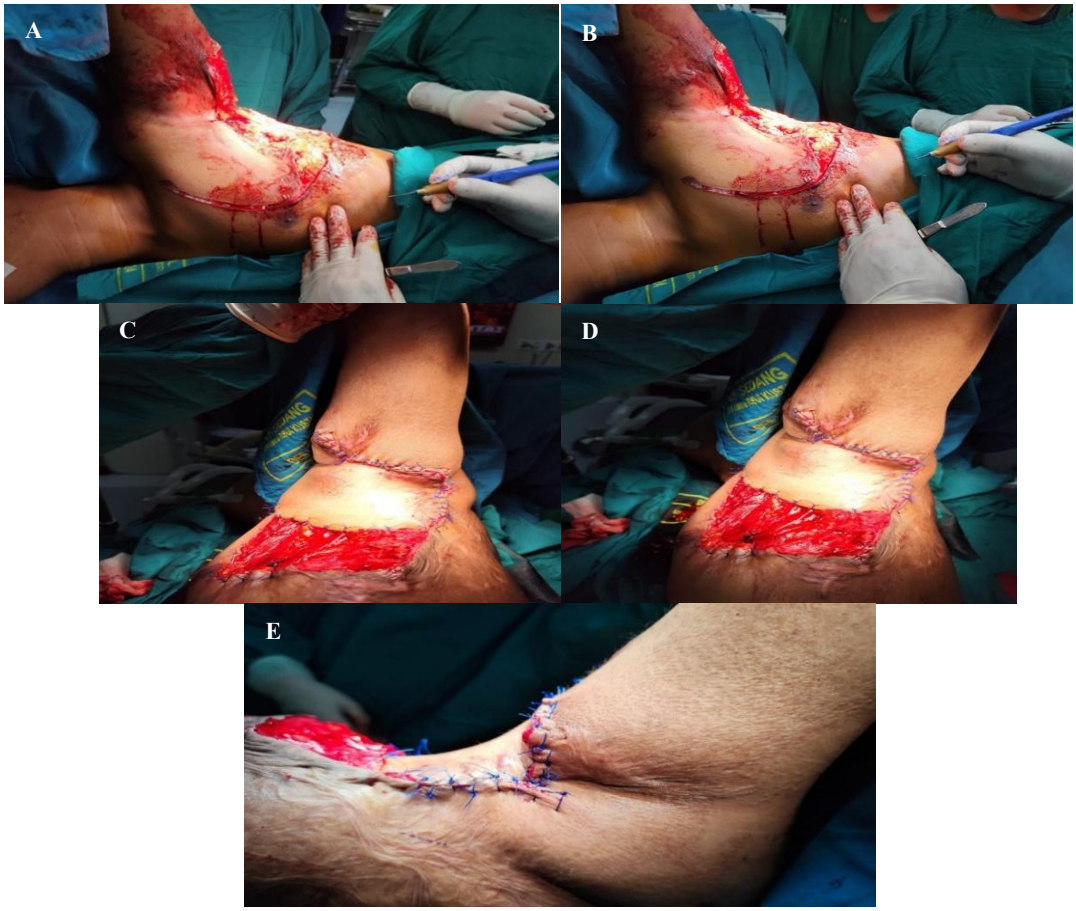

Figure 3 (A-E): Durante op transpositional flap pictures.

Figure 4 (A and B): 7-day follow-up pictures.

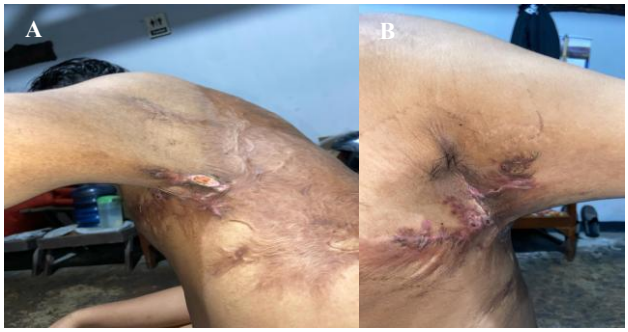

Figure 5 (A and B): 14-day follow-up pictures.

Post-operatively, he was kept on IV antibiotics and analgesics with no diet restriction. The patient's current complaint is pain after surgery, but the pain was reduced. The patient was in good condition after the procedure. He appears compos mentis. His vital signs were: blood pressure of 130/80 mmHg, heart rate of 88 beats per minute, respiration rate of 20 times per minute, body temperature of 36.5°C, and oxygen saturation of 99% on room air.

He was discharged home after a day and returned to the hospital after 7 days and 14 days for post-surgery follow-up. His vital signs were: blood pressure of 130/80 mmHg, heart rate of 88 beats per minute, respiration rate of 20 times per minute, body temperature of 36.5°C, and oxygen saturation of 99% on room air. He was discharged home after a day and returned to the hospital after 7 days and 14 days for post-surgery follow-up.

Figure 6 (A-D): Clinical follow up of post-skin graft control stage 2.

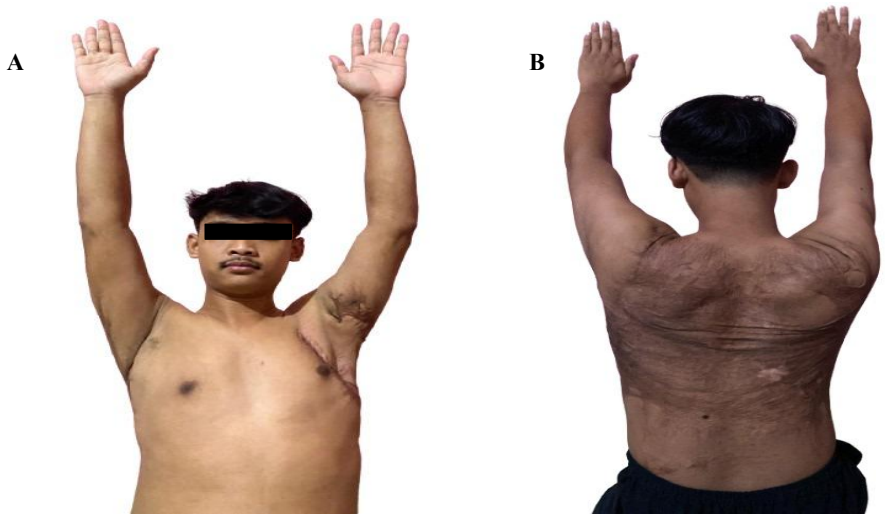

Figure 7 (A and B): Clinical appearance control post skin graft.

DISCUSSION

Burn injuries, particularly in paediatric populations, are associated with a high incidence of long-term complications, including post-burn contractures that significantly impact daily functioning and quality of life.[3-14] Contractures are a common sequela of deep burns, especially when healing occurs through secondary intention or lack of primary management.[5] In this case, the patient developed an axillary contracture following a scald burn sustained in childhood, which progressively restricted movement and impaired functional capacity over the years.

The axilla is a high-risk anatomical region for contracture formation due to its role in upper limb mobility. Axillary contractures, as classified by the Kurtzman and Stern system, present a surgical challenge, particularly in cases involving both anterior and posterior folds with axillary dome involvement.[10-15]

The Kurtzman and Stern classification divides axillary contractures into three types: Type I, II, and III. Type I is a mild contracture that involves only one axillary fold, either anterior or posterior, without involvement of the axillary dome. In this condition, when the arm is elevated, scar tissue forms a web-like structure but still allows for relatively good shoulder range of motion. Type II involves both the anterior and posterior axillary folds, although the axillary dome remains unaffected. This results in restricted abduction and often requires a more complex surgical approach. Type III is the most severe form of contracture, involving both axillary folds and the dome, and may extend to the upper arm and lateral chest wall. The scar tissue typically forms a dense, U-shaped mass that severely limits arm movement, often reducing shoulder abduction to less than 30 degrees. Management of this type generally requires more extensive reconstruction, such as local flaps, skin grafts, or a combination of both.[4,11,16] In this case, the contracture resulted in functional limitations that warranted surgical intervention to restore movement and prevent further disability.[4-17]

Surgical management remains the gold standard for post-burn contractures, with the primary goal being to release the scar tissue and restore the anatomical and functional integrity of the affected area.[9] Various reconstructive techniques are available, including skin grafting and local or distant flap-based reconstructions.[10] However, there is no universally accepted surgical approach, and the choice of technique depends on factors such as contracture severity, tissue availability, and the surgeon's expertise.[18,19]

Postoperative care, including infection prevention, pain management, and physiotherapy, is crucial for optimizing surgical outcomes and preventing contracture recurrence. In this case, the patient was prescribed IV antibiotics and analgesics, with a structured follow-up plan at 7 and 14 days post-surgery. Early postoperative mobilization and physiotherapy are key components of rehabilitation to maintain the newly gained range of motion and prevent secondary complications.[20,21]

This case highlights the importance of timely surgical intervention in managing post-burn contractures, particularly in resource-limited settings where delayed treatment often leads to severe functional impairments. It also demonstrates the advantages of transpositional flap and skin graft as a technique that can be used for the surgical release of narrow contractures with bilateral laxity.

CONCLUSION

Post-burn axillary contracture remains a major challenge, not only from a surgical standpoint but also because of its profound impact on a patient's independence and quality of life. Surgical release continues to be the cornerstone of treatment, offering a path toward restoring function and dignity that years of scarring may have taken away. From our experience, timely and well-planned reconstructive surgery can safely and effectively correct even severe contractures with both anterior and posterior involvement, including cases where definitive management has been delayed for many years.

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