



Role of Innovative Splint for Post-Operative Care of Groin Flap

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Received date: 26 November 2024; Accepted date: 05 December 2024; Published date: 13 December 2024

Citation: Chittoria RK, Gautam S, Kumar RV (2024) Role of Innovative Splint for Post-Operative Care of Groin Flap. SunText Rev Med Clin Res 5(2): 202.

DOI: <https://doi.org/10.51737/2766-4813.2024.102>

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Abstract

Pedicled flaps, used in reconstructive surgery, require careful postoperative positioning to ensure optimal healing and flap survival. This case report explores the use of an innovative triangular splint for postoperative care following a groin flap procedure on a 15-year-old male with postburn contractures on the left hand. The splint, crafted from cost-effective Cramer wire and padded with cotton, effectively maintained the desired hand and wrist position, provided firm support, and ensured patient comfort during recovery. The patient reported reduced postoperative pain, high mobility, and overall satisfaction with the splint. Postoperative management of flaps typically involves customized splints to prevent complications like edema and tissue damage while promoting anti-contracture positioning. The splint described in this study demonstrated practical advantages, including ease of application, affordability, and adaptability for various clinical settings. While this innovative approach proved successful in a single case, further studies on a larger cohort are required to validate its efficacy. The findings highlight the potential for using simple, low-cost materials to improve surgical outcomes in resource-limited settings.

Keywords: Groin flap; Splinting; Post-operative Splinting; Cramer wire

Introduction

A pedicled flap is created when the surgeon moves tissue from one area of the body to a surgical site that needs coverage, known as the recipient site, while keeping the tissue attached to its original blood supply. Flaps can be used to reconstruct various parts of the body, including areas like the head, neck, chest, arms, legs, lower back, buttocks, or vagina. The tissue remains connected to its original location at one end, while the other end is moved to cover the surgical site. If additional skin is needed to cover the incision, extra skin may be harvested from another area, such as the thigh. However, positioning of the operated site is of utmost concern during the postoperative management of pedicled flaps. This case report will explore the use of innovative ring splints in the postoperative care of the surgical site.

Materials and Methods

This study was conducted in the Department of Plastic Surgery in a tertiary care centre in South India. The subject was a 15 year old male presenting with post burn contractures over the left hand for 12 years due to scald burn. After contracture release over the 3rd and 4th fingers of left hand, groin flap was used to cover the raw area. Post-operative positioning for the flap was done with innovative triangular splint made from Cramer wire, well-padded with cotton roll placed in between the body and the arm to keep contact firm, tension adequate, and position of hand and wrist in normal resting position. The cost of making the innovative splint is very minimal and is readily and easily applicable.

Results

In this case report, patient was comfortable postoperatively with the splint, the patient compliance was good as patient could ambulate in any direction in bed without any harm to the flap site. The patient was satisfied with the splint as he felt less postoperative pain with well-padded splint.

Discussion

Post-surgery, loco-regional and free flaps require careful monitoring to ensure proper positioning and stabilization. Customized splints or Plaster of Paris (POP) supports are often utilized, with a strategically placed window to facilitate ongoing observation of the flap. This approach allows for regular assessment of the flap's condition while maintaining its protection and alignment during the healing process (Table 1) [1].

Table 1: Different splints and body parts.

Body Part and purpose	Type of Splint
Anterior Neck Burns	Halo neck splint that positions the neck in extension using the head and upper torso for stabilization.
Neck Contractures	Watusi Collar (a series of cylindrical plastic foam tubes fastened circumferentially around the neck)
Chest	Back brace or Spinal support
Shoulder or Axilla	Airplane or axillary splint
Finger	Finger extension splint or a thumb spacer
Mouth	Mouth Splint to keep the skin from shrinking around during the healing process and restore motion of the shoulder
Hand	Hand splint
Wrist	Wrist splint or wrist orthosis
Elbow	Elbow splint
Hip	Anterior hip spica splint
Knee	Common knee splints are: Gutter or / trough splint; knee comforter
Ankle and foot	Posterior foot splint; anterior ankle comforter and toe comforter

Proper positioning and splinting play a critical role in post-surgical care, as they help reduce edema, protect tissues from damage, maintain soft tissues in an elongated state to support healing, and promote an anti-contracture posture. Three main types of splints are commonly utilized in this process:

- Static Splints:** These provide firm, fixed support to immobilize the affected area and maintain the desired position.
- Static Progressive Splints:** These allow for gradual adjustments to improve range of motion and soft tissue length over time.
- Dynamic Splints:** These include movable components designed to facilitate controlled movement, aiding in functional recovery.

The selection of the appropriate splint depends on the specific surgical requirements and the patient's recovery needs [2,3]. Static, static progressive, and dynamic splints each serve distinct purposes during different phases of post-surgical recovery [4].

1. Static or Primary Splints:

- Utilized during the acute phase of recovery, these splints protect skin grafts and aid in anti-contracture positioning.
- They are typically applied to adjacent, healthy skin to immobilize and safeguard the surgical site.

2. Static Progressive or Postural Splints:

- Introduced after the grafting phase, these splints are used when static positioning and exercises fail to achieve sufficient range of motion (ROM).
 - They are often employed to correct contractures and are commonly applied in the treatment of burn patients.
- ### 3. Dynamic or Follow-up Splints:
- Designed to enhance functionality, these splints exert a gentle, consistent force to stretch contractures or provide resistance for strengthening exercises.
 - They are valuable in post-surgical and post-burn rehabilitation to restore movement and function.

Immediate initiation of physical therapy and appropriate splinting post-surgery is vital to support recovery and optimize functionality in the affected body parts (Figure 1).



Figure 1: Use of innovative splint for post-operative care of groin flap.

Splints are essential in stabilizing and immobilizing skin grafts and flaps, ensuring protection and proper healing newly placed grafts and flaps are safeguarded during the healing process, while deformities are either prevented or corrected as part of post-surgical care. In our study, we focused on using readily available and cost-effective materials to create a splint specifically designed for the protection and stabilization of groin flaps. This approach ensured both functionality and affordability in patient care.

Conclusion

The innovative splint proved effective in ensuring proper postoperative positioning and significantly improved flap survival outcomes. However, as this conclusion is based on a single case report, further validation is necessary through its application in a larger cohort of patients. These splints are highly adaptable, making them practical for use in various hospital settings, and



their broader implementation could confirm their efficacy and reliability in different clinical scenarios.

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