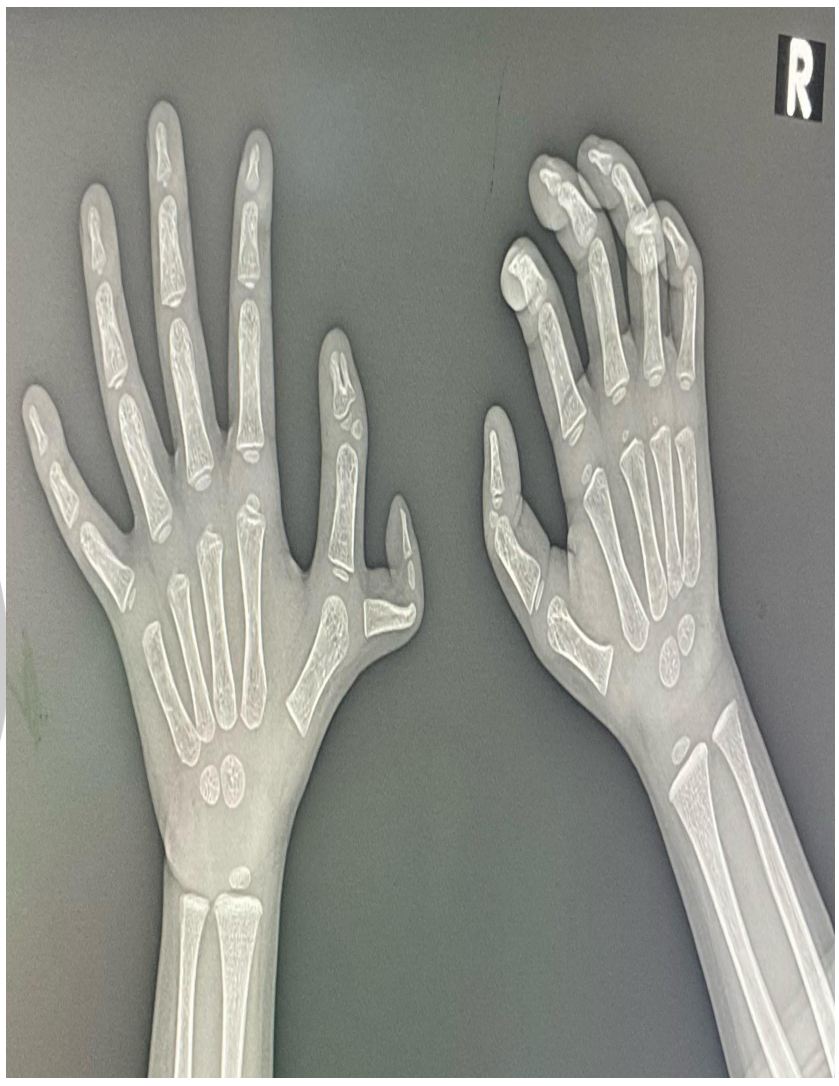
Volume 1 – Number 2 – November 2025 www.SLAPRAS.com

Sri Lanka Association of Plastic,Reconstructive and Aesthetic Surgeons

Asian Journal of Plastic and Reconstructive Surgery



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Case Report

Surgical Correction of Tuberous Breast Deformity: Refining Technique for Optimal Aesthetic Outcomes

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Introduction

Tuberous breast deformity is a rare congenital deformity characterised by abnormal breast development, often presented in the pubertal age. The hallmark feature of this deformity is changes in the breast morphology. It can present as both unilateral or bilateral and symmetric or asymmetric, which can lead to psychological distress in the patient, particularly due to the appearance of the breasts. Tuberous breast deformity has been graded using numerous classifications by clinicians. The Von- Heignburg system, originally a four-type system, is based on which breast quadrants are deficient and the degree of skin and breast base constriction. The Grolleau system is a simplified three-type classification. Both system helps plastic surgeons assess the severity of the deformity and plan the most effective surgical approach.We have used the Grolleau classification in our study.

- Type I: hypoplasia of the lower medial quadrant. This is the most common type.
- Type II: bilateral hypoplasia of the lower quadrants. The subareolar cutaneous segment is short, and the areola points downward.
- Type III: hypoplasia of all four quadrants and constriction of the breast base both horizontally and vertically.

The pathophysiology behind tuberous breast deformity involves malformation in the superficial layer of Camper's fascia, which is found beneath the areola, which is lacking, and thickened superficial fascia, particularly in the breast's lower pole. Its normal development is altered by the constricting ring that surrounds the nipple-areola complex (NAC) in tuberous breasts. As a result, the breast cannot grow toward the lower pole. Because of the weak spot created at the areola level by the lack of this fascial layer, the growing breast can herniate towards the NAC [2]. The deformity can be corrected by reconstructive surgery. The reconstructive difficulty of this deformity is reflected in the various surgical approaches described to increase the volume of the breasts in the lower pole of the breast [3]. The techniques typically focus on expanding the lower breast pole improving symmetry, and repositioning the NAC, but the complexity of the surgery varies depending on the severity of the deformity.

In cases of Type III deformities, a more extensive procedure may be required to address the significant constriction and hypoplasia across all quadrants of the breast. The lack of uniformity in the presentation of tuberous breast deformity compounds reconstructive challenges, making individualised treatment plans essential. The diverse surgical methods available reflect the need for tailored interventions that take into account each patient's specific characteristics and the severity of the deformity. These can range from simple augmentation to more complex tissue rearrangement, including nipple-areola complex repositioning, glandular tissue release, and sometimes fat grafting or implant insertion to restore volume and symmetry [3]. Despite the complexities, advances in surgical techniques have significantly improved outcomes, helping individuals with tuberous breasts achieve better aesthetic results and, importantly, higher self-esteem.

Case Presentation

A 13-year-old girl was referred to the plastic and reconstructive surgery clinic of a tertiary care centre from the paediatric surgery clinic with a complaint of bilateral asymmetric breast contour for the past 2 years as noticed by the mother. The patient had no other complaints like breast lumps, pain, or secretions. She had undergone a polydactyly removal at 8 months of age and a laparoscopic appendicectomy in 2021. Her past medical history is significant for bronchial asthma, which is poorly controlled and requires frequent hospitalisations. She attained menarche at the age of 10, and she is currently having a regular menstrual cycle with no complaints. Her birth and developmental history were insignificant. There is no family history of tuberous breast disease, breast cancer, or bone tumours.

Her physical examination showed bilateral hypoplastic breasts, a herniated enlarged areola, an undeveloped lower pole, and a poorly defined fold. The right breast was Grolleau classification type 2, and the left was type 3 (figure 1).

Ultrasound of the breast revealed a bilateral asymmetric distribution of fibro-glandular tissues of the breasts. No mass lesions, axillary lymphadenopathy, or changes in the nipple-areolar complex were observed. The surgical reconstruction was performed under general anaesthesia. A doughnut-shaped incision was made around the areola, adjusting the nipple-areolar complex size (NAC). De-epithelialization of the skin was done in between the incisions. Any constriction bands were removed, and breast tissue herniated into the NAC was relocated. The skin was sutured using 3/0 barbed monocryl sutures. A good cosmetic result was achieved on the table (figure 2).

The patient presented with a relapse 2 months later which was surgically corrected. There is a possibility of relapse but it can be revised using a smaller surgery. However this technique is limited to breasts with relatively normal tissue architecture rather than extremely hypoplastic breasts. Later on the patient presented with areolar stretching which was corrected surgically by a short procedure.

Discussion

Several studies have evaluated different surgical techniques for correcting tuberous breast deformity, with varying approaches and outcomes. A study in Spain assessed the use of the modified Puckett's technique with a double unfolded subareolar glandular flap on 42 breasts in 26 patients over 12 years. This technique, performed via a periareolar incision, demonstrated high rates of complete correction. The advantages of this approach include restoration of the lower breast pole, reduction of the "double-bubble" effect, correction of the inframammary fold, and improvement in areola size and herniation [3].

A retrospective study from St. Petersburg State Pediatric Medical University evaluated 208 patients (414 breasts) treated between 2005 and 2017 using breast parenchyma modification with simultaneous augmentation. The technique included periareolar incisions, vertical and horizontal glandular scoring, dual-plane pocket creation, and anatomical implants. The complication rate was 8.9%, with 1.4% capsular contracture and 2% "double bubble" deformity. The study concluded that this one-stage approach minimises complications and provides satisfactory outcomes [4].

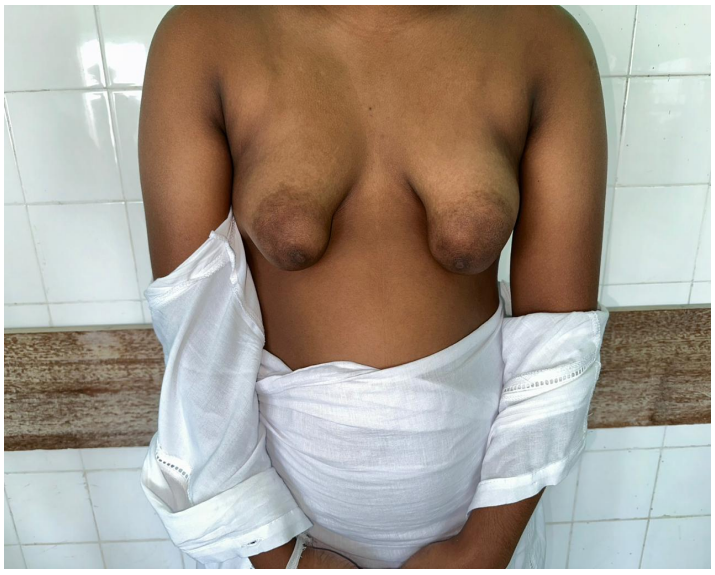
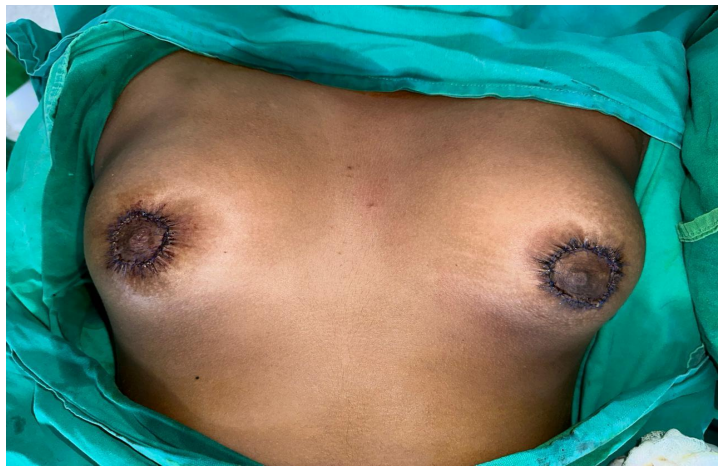


Figure 1: Preoperative appearance

A study from September 2006 to December 2015 followed 78 patients (145 breasts) who underwent surgical correction using periareolar approaches and adipose-glandular flaps with dual-plane breast implant placement. The complication rate was low, with 6.4% of patients experiencing minor issues like capsular contracture or hypoesthesia. No major complications like necrosis or poor wound healing were reported, indicating a successful, low-risk technique [5]. Another retrospective study at the Icahn School of Medicine (2008–2012) included 26 patients (51 breasts) treated with periareolar access, glandular scoring, and subpectoral implants. The overall complication rate was 7.8%, with capsular contracture and malposition as the primary issues. The study found satisfactory results with individualised mastopexy techniques based on the type of deformity [6].

Several studies have explored autologous fat transfer for TBD correction, particularly in young patients. A study on 10 patients (mean age 17.5 years) using lipofilling showed stable results over an average follow-up of 68 months, with no significant complications other than one case of oil cysts. The technique was deemed effective, particularly for minimising scarring. Another study with 31 patients showed a 94% success rate over 11 years, indicating fat grafting as a reliable and lasting alternative to traditional surgery [7][8]. A study comparing patient satisfaction between breast implants and autologous fat grafting found that breast implants resulted in significantly higher satisfaction rates. The lipofilling group required more interventions to achieve satisfactory results, highlighting breast implants as a more consistent and preferred option for tuberous breast correction [9].



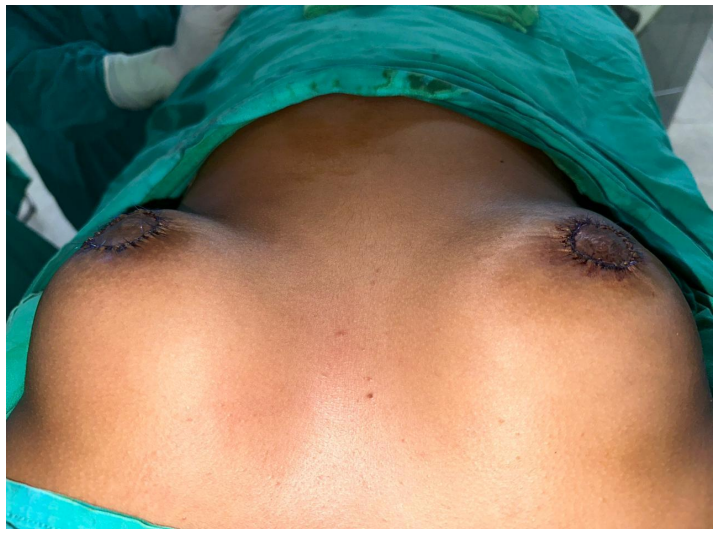


Figure 2: Immediate Postoperative appearance

Conclusion

Tuberous breast deformities exhibit significant variability, even between the two breasts of the same patient. As a result, a single surgical approach may not be suitable for both breasts. Although there is a well-established classification system for tuberous breast deformity, there is no standardisation in surgical techniques. Various methods are described in the literature, but consensus on the best approach for long-term outcomes remains lacking. Breast implants and autologous fat grafting are the most commonly used. In young patients with sufficient breast volume, the doughnut and purse-string techniques have shown success in repositioning the breast tissue within the chest wall. However, over time, there is a risk of stretching or expansion of the nipple-areola complex. In such cases, revision surgery to adjust the areola size may be necessary. Typically, a 10-year follow-up is recommended after correction of tuberous breast deformities to assess long-term results.

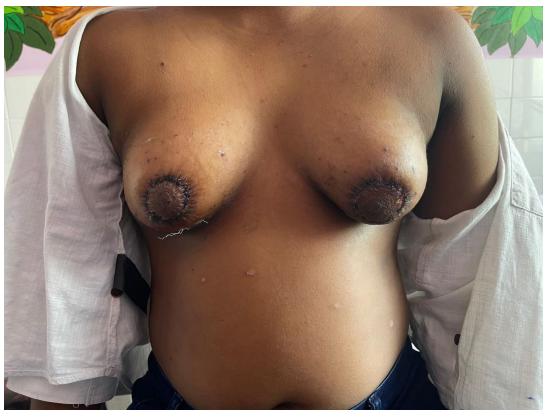


Figure 3: Post Operative appearance

Declarations

None

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Ethics approval and consent to participate

Not applicable

Consent for publication

Informed written consent for publication and accompanying images was obtained from the patients prior to collecting information.

Availability of data and material

All data generated or analyzed during this study are included in this published article.

Competing interests

The authors declare that they have no competing interests.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

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Sri Lanka Association of Plastic, Reconstructive and Aesthetic Surgeons

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Case Report

Hibernoma Masquerading as a Conventional Lipoma: A Rare Diagnosis Unveiled by Histopathology

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Introduction

A hibernoma is a rare benign tumor composed of brown fatty tissue. It primarily affects young individuals and typically occurs in areas where brown fat is retained after fetal development. The thigh is the most commonly affected area, followed by the trunk, upper extremities, head and neck[1].Some publications detail the imaging findings associated with hibernomas, however, it is not always possible to definitively diagnose a hibernoma, based on imaging alone[2].This case highlights the importance of considering hibernoma in atypical soft tissue masses and the role of surgical excision for diagnosis and treatment.

Case Presentation

A 19-year-old male presented to our clinic with a hemispherical lump at the interscapular region that had persisted for over three years. Apart from the cosmetic concern, he reported no symptoms or functional limitations. Clinical examination revealed a conventional lipoma measuring 4 cm * 1 cm located on the back of the chest, 2 cm below and 6 cm medial to the inferior angle of the left scapula. An ultrasound scan of the lump showed a well-defined, oval, heterogeneous, hyperechoic mass located deep to the subcutaneous fat and superficial to the back muscles, measuring 4.2 cm * 1 cm, without increased vascularity or deep extensions. Since the imaging findings supported a diagnosis of a simple lipoma, we proceeded with lipoma excision under local anesthesia without requesting further imaging investigations. Intraoperatively, the excised lump did not exhibit the typical features of a conventional lipoma, as it was a brownish fatty mass with a well-defined capsule.

Grossly, the tumour had a yellowish lobular appearance. Microscopy revealed a lipomatous tumour composed predominantly of brown fat cells admixed with mature white fat cells. The brown fat cells contained round central nuclei and a multi vacuolated eosinophilic granular cytoplasm. A rich capillary network was present. Nuclear atypia, mitotic activity or lipoblasts were not seen. All these findings conclude that the lump is compatible with a Herbinoma. (Figure 1)

Discussion

A hibernoma is an uncommon, soft tissue tumor that arises from remnants of brown fat, It typically presents as a benign, lobulated, and nontender lesion[1]. Although hibernomas can manifest at any age, they tend to appear most commonly in individuals during their third and fourth decades of life, with male predominance[3]. These tumors typically develop in several areas of the body: the lower limbs (33%), the trunk (23%), the upper limbs (22%), the head and neck (13%), and the abdomen/retroperitoneum (9%) [1].

Imaging findings of hibernoma in the lower extremities have been reported numerous times. Ultrasound (US) often reveals a well-defined hyperechoic mass relative to subcutaneous fat. Routine radiography has shown a small soft tissue lesion or swelling without calcification or bone erosion. Doppler imaging has indicated hypervascularity and a hyperechoic mass on ultrasound [2,4]. Complete excision is the definitive treatment for hibernomas, and there have been no reports of local recurrence or aggressive behavior, even in cases of partial excision[1].

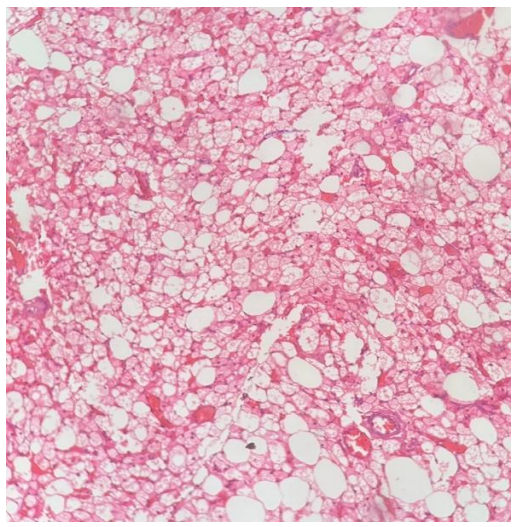

Figure 1- Hibernoma composed predominantly of brown fat cells. A rich capillary network is seen. (H&E stain x100)

Conclusion

This case highlights a rare instance of hibernoma, which was initially misidentified as a conventional lipoma based on clinical and imaging findings. The diagnosis was ultimately confirmed through histopathological examination, highlighting the importance of tissue analysis when intraoperative features differ from expected presentations. Although hibernomas are uncommon, they are benign lesions, and complete surgical excision is a curative treatment.

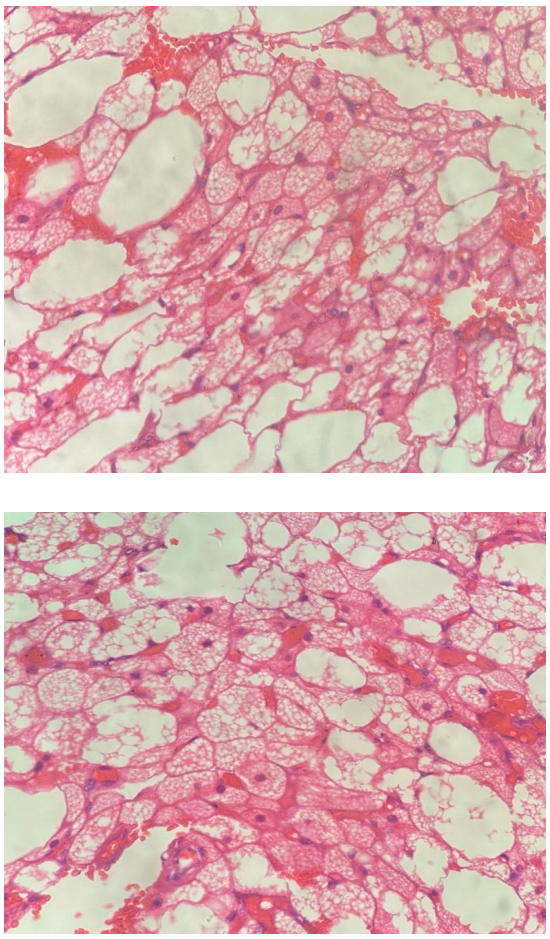

Figure 2,3 : Brown fat cell composed of round central nuclei and a multivacuolated cytoplasm. (H&E stain x400)

Declarations

None

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Availability of data and material

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Competing interests

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Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

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Case Report

Successful Staged Macrocephaly Reduction Surgery in Sri Lanka

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Abstract

Background: Severe macrocephaly from untreated infantile hydrocephalus is rare but still encountered in low-resource settings. Without timely diversion, progressive calvarial expansion and developmental delay can ensue.

Case: A boy with antenatally diagnosed hydrocephalus had parental refusal of shunting in infancy and was lost to follow-up. He presented at 7 years with extreme macrocephaly and profound gross motor delay but relatively preserved speech and cognition. A staged strategy (initial ventriculo-peritoneal [VP] shunt, dural release, serial anterior/posterior cranial vault reductions, and final contouring) was performed across two years. Complications included a prolonged cerebrospinal fluid (CSF) leak that settled conservatively and formation of a "dual skull" (intradural neobone with extradural hydroma) requiring further reduction. By the end of staged surgery and intensive physiotherapy, he achieved independent ambulation with minimal support and a near-normal head position.

Conclusion: In older children with long-standing hydrocephalic macrocephaly, staged reduction cranioplasty following CSF diversion can restore function and cosmesis when paired with structured rehabilitation. Early shunting remains standard of care, but delayed staged reduction is a viable salvage pathway.

Keywords: Hydrocephalus, Macrocephaly, Ventriculoperitoneal shunt, Reduction cranioplasty

Introduction

Macrocephaly is a head circumference >2 SD above the age-matched mean. When due to untreated hydrocephalus, the head can become too large and heavy for postural control, impairing gross motor development and quality of life. While VP shunting or endoscopic third ventriculostomy (ETV) are the guideline-supported mainstays of infant hydrocephalus, late presenters may need calvarial volume reduction to regain head control and mobility.

Case Description

Master L, the second-born child of non-consanguineous parents, was delivered at 32 weeks of gestation by elective caesarean section after antenatal ultrasound revealed congenital hydrocephalus. Despite counseling, his parents declined ventriculoperitoneal (VP) shunting in infancy due to concerns regarding anesthesia and surgery, and defaulted subsequent follow-up. At seven years of age, he presented to the neurosurgical unit with massive macrocephaly, profound gross motor delay, absence of head control, and reliance on "floor-dragging" mobility. Interestingly, cognitive function, language, and comprehension were relatively preserved, and there was no history of seizures or raised intracranial pressure symptoms.

Figure 1: Master L prior to the treatment of macrocephaly in 2016

Procedures

The management goal was to reduce cranial volume, restore head balance, and facilitate developmental progress in a child with otherwise preserved intellectual ability. A staged surgical approach was undertaken.

Stage 1 - CSF Diversion and Dural Release
A medium-pressure VP shunt was placed for cerebrospinal fluid (CSF) diversion. Postoperative imaging demonstrated a chronic subdural hematoma, necessitating shunt ligation and decompression. Subsequently, a craniectomy with meticulous release of dural adhesions along the superior sagittal sinus was performed. The postoperative period was complicated by a prolonged CSF leak, which eventually resolved without re-operation.

Stage 2 - Anterior Vault Reduction and Reconstruction
An anterior cranial vault reduction was performed with mesh plate reconstruction, which significantly improved frontal bossing and cranial balance. Following this intervention, the child achieved partial head control and demonstrated improved speech, making him a candidate for further reconstructive stages.

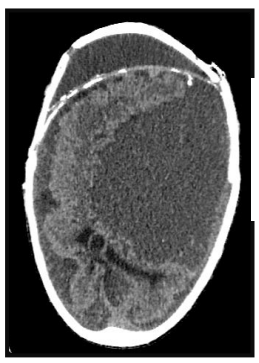

Figure 2: CT scan of brain (axial view) obtained in 2022 October, after 1st anterior vault reduction and reconstruction, yet showing significant compression of brain matter

Stage 3 - Posterior Vault Reduction. A posterior vault reduction was performed through a coronal parieto-occipital approach with mesh fixation. Follow-up imaging revealed dual calvaria formation, with new ossified bone developing along the dura and a fluid plane separating it from the outer cranial vault.

Stage 4 - Final Vault Reduction and Contouring
Residual cranial deformities and excess ossified bone were excised, and contour harmonization was achieved using mesh reconstruction.

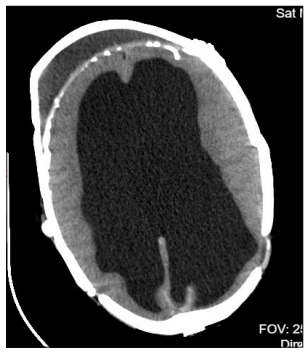

Figure 3: CT scan of brain (axial view) obtained in 2023 May, after shunt removal and awaiting further surgery

Outcome

The child underwent intensive physiotherapy focusing on cervical and paraspinal extensor strengthening, gait training, and postural control. By four years after initial presentation, he was able to maintain near-normal head positioning, walk independently with minimal support, and achieve a satisfactory cosmetic outcome.

Discussion

Contemporary evidence-based guidance (Congress of Neurological Surgeons, original 2014 and 2020 update) supports CSF diversion with VP shunt or ETV depending on etiology, age, and anatomy. ETV (often with choroid plexus cauterization in infants) has expanded but shunting remains predominant in infants; large networks (e.g., HCRN) have protocolized shunt care and infection mitigation. Ongoing trials continue to compare ETV/CPC with shunting in early infancy

. Implication for late presenters: For children who miss early diversion and develop hydrocephalic macrocephaly, shunt alone rarely reduces head circumference sufficiently for postural recovery; reduction cranioplasty becomes a reconstructive adjunct.

Figure 4: Photos of Master L taken in August 2024, who is now able to walk with support and converse well.

A 2024 systematic review of 27 studies reported improvements in head positioning, cosmesis, and global function after reduction cranioplasty, with notable blood loss and shunt-related complications underscoring the need for careful selection and experienced teams. Long-standing ventriculomegaly “pushes” the calvaria outward while sutures typically remain patent/diastatic. After shunt placement, a distinct entity shunt-related (secondary) craniosynostosis can occur, likely from loss of dural/sutural tension, with premature fusion of one or more sutures and thickened vault; reported but variable in incidence, it complicates head shape and may require remodeling.

Large, single-session reductions risk venous kinking and infarction (given inability to “shorten” superior sagittal sinus and skull base) and abrupt brain infolding. Staging allows gradual extracranial volume normalization while respecting venous outflow. Technique families (e.g Mechanism: how the VP shunt “sets the stage” for head-size reduction. VP shunting lowers intraventricular pressure and reduces ventricular volume, enabling the brain to re-expand (in infants) or, in long-standing cases, to “settle” within the capacious skull but the osseous envelope usually remains oversized. Diversion also predisposes to subdural collections during rapid pressure shifts, a known shunt effect that often requires management before definitive vault work.

In hydrocephalic macrocephaly, the dura can be tethered to the ectatic inner table, especially near the superior sagittal sinus. Extradural (endocranial) release; careful subperiosteal/epidural dissection and lysis of dural adhesions; restores dural mobility and makes subsequent segmental reductions safer by minimizing venous traction. This step, used in our case prior to vault reduction, helped the brain “settle” gradually before external volume reduction.

Operative strategies then combine partial-thickness osteotomies, segmentation (quadrants/“picket fence”), controlled wedge resections, and mesh-assisted refashioning; programmable valves can be considered where suture fusion or over-drainage complicate shape.

The dura mater is osteogenic; it orchestrates calvarial morphogenesis by secreting growth factors and recruiting osteoprogenitors. After dural release/reconstruction, intramembranous ossification over the dura can create an inner neocalvaria, clinically visualized as a “dual skull” with a fluid plane (hydroma) between inner and outer tables, as in our patient. This phenomenon is well documented experimentally and clinically.

Years of macrocephaly lead to cervical extensor hypoplasia and poor trunk control. Pediatric neuro-physiotherapy focusing on cervical extensor strengthening, postural control, vestibular/righting reactions, and progressive gait training is essential; recent pediatric case reports in hydrocephalus show meaningful gains in head/trunk control and gross motor milestones with structured programs. Aquatic or ball-based interventions can augment cervical activation when tolerated.

Conclusion

This case highlights that, even after late presentation, a staged pathway CSF diversion, dural/endocranial release, serial volume reductions and contouring can yield functional independence and acceptable aesthetics when paired with targeted rehabilitation. Early shunting remains the standard; however, delayed, staged reduction is a valid salvage strategy in carefully selected older children.

Acknowledgements
We acknowledge the multidisciplinary Neurosurgery, Plastic Surgery, and Physiotherapy teams involved in the child’s care.

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Consent for publication
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Funding
The authors received no financial support for the research, authorship, and/or publication of this article.

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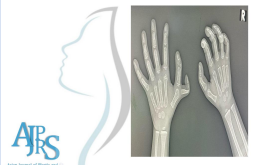

Case Report

A Unique Presentation of Radial Polydactyly Beyond the Wassel Classification

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Introduction

Radial polydactyly, a congenital anomaly characterized by duplication of the thumb, represents one of the most common preaxial limb anomalies, with an incidence of 0.08 to 1.4 per 1,000 live births [1]. The classification and surgical management of radial polydactyly remain challenging due to the heterogeneity of its presentations, particularly in cases that extend beyond classical duplication patterns.

The Wassel classification, established in 1969, remains the most widely utilized system for categorizing thumb duplications. It is based on the level of osseous duplication, ranging from Type I (bifid distal phalanx) to Type VII (duplication extending to the carpometacarpal joint). However, this system does not account for complex anomalies involving dual triphalangeal thumbs or partial phalangeal duplications. More recently, the Oberg-Manske-Tonkin (OMT) classification has been introduced to offer a developmental perspective on congenital hand anomalies, incorporating elements of malformation, dysplasia, and deformation[2]. However, even this comprehensive system does not adequately capture multicomponent duplications involving both osseous and phalangeal anomalies.

We present a unique case of polydactyly that does not conform to existing classification models, featuring a duplicated left thumb with a triphalangism in both radial and ulnar components, and the radial thumb consisting of a duplicated distal phalanx. This report aims to describe the anatomical complexity of this case and to assess the limitations of existing classification systems. By examining the shortcomings of current classification models, we emphasize the need for a more refined framework that incorporates morphological variations beyond standard duplications.

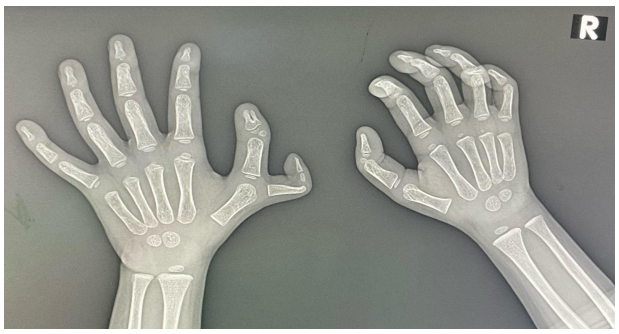

Figure 1: Preoperative x-ray of bilateral hands

Case Description

A 2-year-7-month-old female was referred to our clinic with a duplicated left thumb. The patient's family history was positive for polydactyly, having a third-degree relative with duplication of right thumb. There were no syndromic associations, other congenital anomalies, or functional impairments at the time of examination.

Physical assessment revealed an asymmetric duplication of the thumb. Both radial and ulnar components showed triphalangism, exhibiting a well-formed extra phalanx contributing to an elongated appearance. The ulnar component had a duplicated distal phalanx, leading to an irregular digital structure. The flexion and extension functionality was preserved, but the overall aesthetic and biomechanical profile was suboptimal.

Standard radiographic imaging was conducted to determine the extent of duplication and assess skeletal morphology. X-ray imaging confirmed triphalangism in both components of the left thumb, and a duplicated distal phalanx in the medial thumb, contributing to abnormal digital architecture.

Given the complexity of the duplication pattern, a multidisciplinary surgical plan was developed, aiming for functional restoration and optimal aesthetic reconstruction.

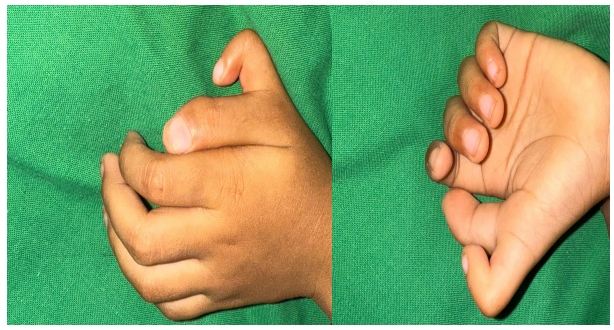

Figure 2: Hands Pre- operatively

Surgical Management

The surgical plan involved:

- Excision of the triphalangeal radial thumb, preserving essential soft tissue and neurovascular structures.
- Preservation of the dominant ulnar thumb, reshaping the distal phalanx for symmetry.
- Ligamentous reconstruction to enhance joint stability and maintain optimal thumb opposition.

The surgery was performed without complications, and structural realignment was successfully achieved

Discussion

Radial polydactyly is traditionally classified using the Wassel system, which outlines seven types of duplication based on the level of osseous division. However, this system does not account for cases that involve both triphalangeal morphology and partial phalangeal duplication. The OMT classification, introduced as an alternative framework, incorporates malformations, deformations, and dysplasias but similarly fails to capture cases that exhibit mixed structural anomalies (3). This case highlights the inadequacy of both classification systems and underscores the need for an expanded classification model that integrates:

1. Triphalangeal thumb variants.
2. Partial phalangeal duplication patterns.
3. Complex polydactyly with combined malformation elements.

Surgical intervention for such cases must be highly individualized, focusing on: functional integrity (opposition, stability, grip strength), aesthetic symmetry (phalangeal alignment, digit length normalization), and joint and ligamentous reconstruction to optimize long-term thumb biomechanics. This case contributes to the growing body of literature advocating for a refined classification system that better reflects the diversity of congenital polydactyly cases.

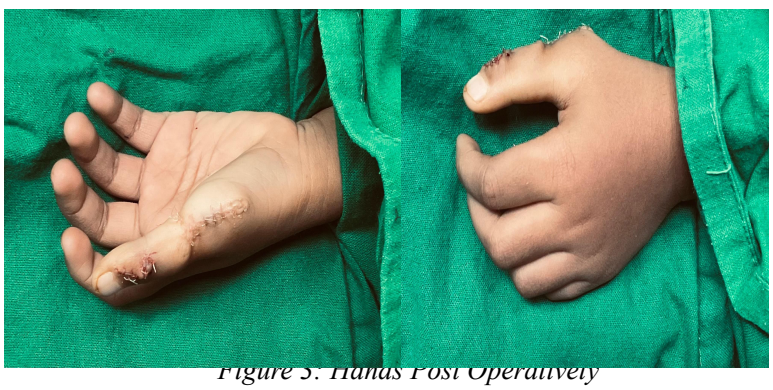

Figure 3: Hands Post Operatively

Declarations
None

ORCID

Consent for publication
Informed written consent for publication and accompanying images was obtained from the patients prior to collecting information.

Availability of data and material
All data generated or analyzed during this study are included in this published article.

Competing interests
The authors declare that they have no competing interests.

Funding
The authors received no financial support for the research, authorship, and/or publication of this article.

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Case Report

Comparative Accuracy and Clinical Utility of Point-of-Care Hemoglobin Analysis Using in Pediatric Craniosynostosis Surgery

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Abstract

Background: Craniosynostosis correction in children often results in significant intraoperative blood loss. Accurate monitoring of hemoglobin (Hb) concentration is essential for timely transfusion decisions. Point-of-care (POC) devices such as HemoCue offer rapid hemoglobin estimation but may differ in accuracy compared to laboratory testing.

Objectives: To compare intraoperative hemoglobin levels measured using the POC device with preoperative laboratory values, evaluate the agreement between methods, and assess the reliability of POC in guiding blood transfusions.

Methods: A retrospective analysis was conducted on 40 pediatric craniosynostosis surgeries performed between 2020 and 2024. Preoperative venous blood Hb values from automated laboratory testing were compared with intraoperative capillary samples analyzed using POC. Statistical tests included Shapiro-Wilk, Wilcoxon signed-rank, and Bland-Altman analysis.

Results: The mean difference between lab and POC Hb readings was 0.53 g/dL (SD ±0.65), with a median difference of 0.35 g/dL. While most measurements were within clinically acceptable ranges, some discrepancies reached 2.0 g/dL. Bland-Altman plots confirmed good agreement. Intraoperative transfusions were guided by POC values in 80% of patients, with no reported morbidity.

Conclusion: POC devices provided sufficiently accurate intraoperative hemoglobin readings to guide transfusion decisions during pediatric craniosynostosis surgery. While discrepancies exist, the clinical utility and immediacy of results support its continued use, particularly where lab access is limited.

Keywords: Craniosynostosis, Hemoglobin Monitoring, Pediatric Surgery, Blood Transfusion, Point-of-Care Testing

Introduction

Craniosynostosis is a congenital condition characterized by the premature fusion of cranial sutures, leading to abnormal skull growth and elevated intracranial pressure. Early surgical correction is essential to prevent neurodevelopmental delays [1]. However, craniosynostosis surgery is often associated with significant intraoperative blood loss, posing increased risks in young children due to their lower circulating blood volumes [2,3]. Maintaining adequate hemoglobin concentration is critical during these procedures, with transfusion thresholds commonly based on hemoglobin levels falling below 10 g/dL [4]. Although laboratory hemoglobin testing is considered accurate, it is often delayed during surgery. In contrast, POC testing using devices provides rapid bedside hemoglobin estimation; however, concerns remain about its accuracy and the variability of results, particularly with capillary samples [5]. This study aims to assess the clinical reliability of intraoperative POC readings by comparing them with preoperative laboratory values in pediatric craniosynostosis surgeries, evaluating accuracy and variability using Bland-Altman analysis, and determining the impact of POC results on intraoperative transfusion decisions.[3].

Methods

This retrospective observational study included 40 pediatric patients aged 1–10 years who underwent craniosynostosis surgery at the National Hospital of Sri Lanka between 2020 and 2024. Patients were included if they had complete paired hemoglobin measurements from both laboratory testing and intraoperative POC analysis, with no history of preoperative blood transfusion. Those with missing data or complex comorbid conditions were excluded. Preoperative venous blood samples were collected 48 hours prior to surgery, while intraoperative capillary samples—obtained from finger or heel pricks—were taken immediately after the induction of anesthesia and before the administration of significant intravenous fluids or the onset of major blood loss. POC hemoglobin readings were recorded at this point. Statistical analysis was performed using SPSS software. The Shapiro-Wilk test was used to assess the normality of data distribution, while differences between paired hemoglobin values were analyzed using the Wilcoxon signed-rank test. Agreement between methods was evaluated using Bland-Altman plots. Ethical approval for the study was obtained, and retrospective access to patient data was granted by the hospital.

Results

1.Patient Characteristics:

Variable	Value
Total patients	40
Female	24 (60%)
Male	16 (40)
Age 1-3 years	82 (70%)
Age 3-6 years	8 (20%)
Age 6-10 year	10 (10%)

Table 1: *Demographic Characteristics of Pediatric Patients Undergoing Craniosynostosis Surgery*

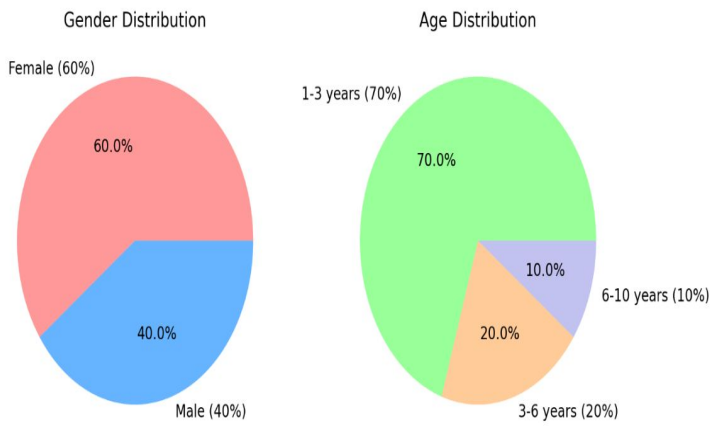

Fig 1: *Age and gender distribution of patients who underwent craniosynostosis surgery*

2.Comparison of Hemoglobin Readings:

Parameter	Value
Mean difference (Lab – POC)	0.53 g/dl
Median difference	0.35 g/dl
Standard deviation	±0.65 g/dL
Range of difference	0.1–2.0 g/dL
Normality (Shapiro-Wilk test)	p = 0.04 (non-normal)
Wilcoxon signed-rank test	p < 0.05 (significant)

Table 2*: Statistical Comparison of Hemoglobin Values Between Laboratory and Point-of-Care Measurements*

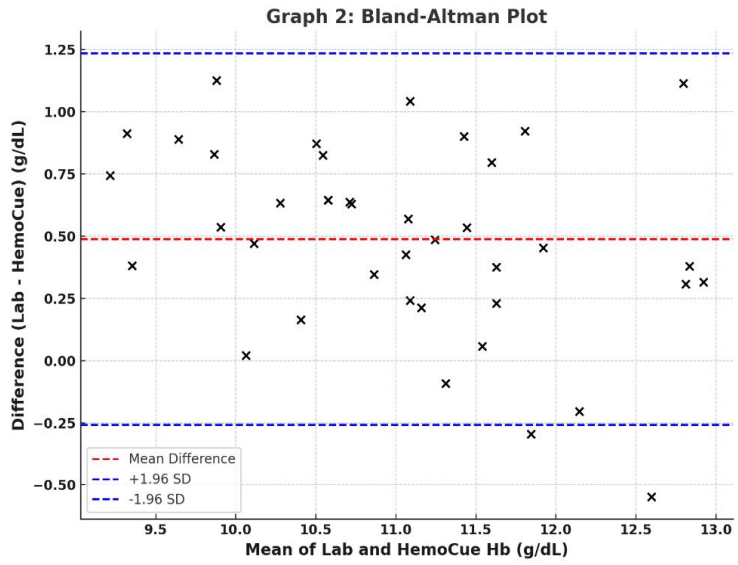

Fig 2*: Bland-Altman Plot**. A scatter plot showing mean Hb value vs. the difference between lab and POC readings.*

Discussion

This study confirms that POC provides reliable and timely intraoperative hemoglobin values suitable for clinical decision-making in pediatric craniosynostosis surgeries. Although it showed a minor underestimation compared to laboratory values (mean 0.53 g/dL), this aligns with findings in similar studies [6–9]. The significance of the Hb difference (Wilcoxon test, $p < 0.05$) indicates consistent variability, but most discrepancies remained clinically acceptable. The Bland-Altman plot demonstrated agreement within ±1.96 SD in 95% of cases, reinforcing previous research supporting POS's utility in surgical and ICU settings [7,8].
Limitations include the retrospective design, absence of venous POC samples for comparison, and potential dilution effects due to fluid shifts during surgery. Despite these, transfusions based on POC values resulted in favorable clinical outcomes, with no reported morbidity.

Conclusion

POC devices offer practical and reasonably accurate intraoperative hemoglobin monitoring in pediatric craniosynostosis surgery. While minor discrepancies exist, they are not clinically significant in most cases. The device facilitated timely transfusion decisions and ensured safe surgical outcomes.

Limitations

Retrospective design.
No concurrent venous sampling.
Possible fluid-related dilution not fully quantified.

Recommendations

Conduct prospective studies using simultaneous capillary and venous sampling. Employ serial Hb measurements to observe trends post-transfusion.
Evaluate POC device accuracy across broader pediatric surgical populations.

Conflict of Interest
No conflict of interest declared. The HemoCue device was used without external sponsorship or manufacturer involvement.

Declarations
None

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Consent for publication
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Availability of data and material
All data generated or analyzed during this study are included in this published article.

Competing interests
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Case Report

Symptomatic Accessory Nipple in an Adult Female – A Biopsy Depth Consideration

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Abstract

Supernumerary nipples (polythelia) are rare congenital anomalies with the potential to include glandular breast tissue and exhibit pathological changes. We report the case of a 31-year-old woman with bilateral accessory nipples since birth, who presented with new-onset tenderness of the left lesion. Excision biopsy confirmed nipple-like architecture but was inconclusive regarding deeper mammary elements due to limited sampling depth. This case raises the need for careful biopsy planning when evaluating symptomatic accessory nipples.

Keywords: accessory nipple, polythelia, ectopic breast tissue, excisional biopsy, histopathology

Introduction

Polythelia refers to the presence of supernumerary nipples along the embryonic mammary ridge and is often an incidental, asymptomatic finding. While these structures are frequently dismissed as cosmetic variants, they may harbor glandular tissue capable of benign or malignant transformation, and require clinical evaluation when symptomatic (Fama' et al., 2007). Histologically, they can mirror normal breast components, including ducts and smooth muscle, but the full extent is often only visible with adequate tissue depth (Mehregan, 1981). This report describes a symptomatic adult female with polythelia and explores the diagnostic implications of superficial biopsy.

Case Presentation

A 31-year-old woman presented to clinic with a three-month history of mild tenderness and discomfort in the region of a long-standing accessory nipple located just below the left breast. The lesion had been present since birth and was part of a bilateral presentation, with the left side always more prominent..She denied discharge, pruritus, or rapid enlargement. Her menstrual cycles were regular, though she reported untreated menorrhagia over the preceding year. Obstetric history included one term pregnancy (G1P1C1), with three years of breastfeeding. There was no known history of hormonal disorders.The lesion had been present since birth and was part of a bilateral presentation, with the left side always more prominent..She denied discharge, pruritus, or rapid enlargement. Her menstrual cycles were regular, though she reported untreated menorrhagia over the preceding year. Obstetric history included one term pregnancy (G1P1C1), with three years of breastfeeding. There was no known history of hormonal disorders.

She had no prior evaluation for the accessory nipples but was prompted to seek care due to recent tenderness and a family history of breast cancer in a paternal aunt. Examination confirmed a raised, pigmented lesion just inferior to the left breast fold, consistent with polythelia.

An excisional biopsy was performed. The specimen measured 14x7x6 mm, with a central 5x4x2 mm raised area. Histological examination revealed elongated rete ridges, smooth muscle bundles, lactiferous-type ducts with sinuses, and mild chronic inflammation - features consistent with accessory nipple architecture. Although histological features consistent with an accessory nipple were identified, assessment of underlying glandular parenchyma was limited due to the superficial extent of the excised specimen.

Discussion

The clinical significance of polythelia is often underappreciated, particularly when asymptomatic. However, supernumerary nipples have been shown to undergo fibroadenomatous and neoplastic changes similar to those of normal breast tissue, and cases of carcinoma arising in accessory nipples have been documented (Bruele and Gemignani, 2020).).In one 20-year single-center study, ectopic breast tissue was found in a small but significant subset of patients, and histological analysis revealed several cases of fibrocystic disease and neoplasia (Famá et al., 2016.

Histological analysis remains the diagnostic gold standard, but its accuracy depends on adequate tissue sampling. As demonstrated in this case, superficial biopsy may confirm epidermal and ductal structures but fail to identify glandular elements. Mehregan (1981) noted that accessory nipples often include subcutaneous mammary glands, which are only revealed when deep excision is performed.

Given the anatomical and pathological variability, full-thickness excision is advisable in symptomatic cases or those with risk factors for malignancy. Clinicians should be aware that accessory nipples are not merely dermal lesions and should be approached with the same vigilance as orthotopic breast tissue when symptomatic (Fama' et al., 2007).

Conclusion

This case underscores the importance of adequate biopsy depth in the evaluation of symptomatic accessory nipples. While superficial samples may confirm epidermal and ductal components, deeper sampling is often necessary to assess for glandular tissue or pathological changes. Excisional biopsy remains the preferred approach in such presentations, particularly when there is clinical concern or relevant family history.

Declarations
None

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Consent for publication
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Competing interests
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Asian Journal of Plastic and Reconstructive Surgery

Case Report

Scalp Metastasis from Triple-Negative Breast Cancer in a BRCA1-Positive Young Female: A Case Report

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Abstract

Background: Scalp metastasis from breast cancer is an exceedingly rare event and typically reflects advanced disease. It is especially uncommon as an isolated early manifestation of recurrence in triple-negative breast cancer (TNBC), a subtype known for aggressive behavior and poor treatment response.

Case Presentation: We report the case of a 37-year-old BRCA1-positive female with TNBC who presented with a right breast mass. Following neoadjuvant chemotherapy, she underwent nipple-sparing mastectomy and axillary clearance. Histopathology revealed residual disease and poor response to chemotherapy, with 4 out of 17 lymph nodes involved (ypT2N2a). Three months postoperatively, she developed a tender scalp mass with imaging findings suggestive of metastasis. Surgical excision with flap closure was performed;histopathological analysis confirmed a metastatic deposit of adenocarcinoma infiltrating the fascia and underlying bone marrow, consistent with breast origin based on weak mammaglobin positivity.

Conclusion: This case highlights the importance of clinical vigilance for atypical sites of metastasis in TNBC patients, especially in the setting of known genetic susceptibility and residual disease post-neoadjuvant treatment.

Keywords:Triple-negative breast cancer, BRCA1,Scalp metastasis,Cutaneous metastasis, Breast cancer recurrence, Surgical excision

Introduction

Triple-negative breast cancer (TNBC), defined by the absence of estrogen, progesterone, and HER2 receptors, accounts for 15–20% of all breast cancers and is characterized by rapid progression, high recurrence rates, and limited treatment options (Dent et al., 2008). TNBC exhibits distinct metastatic behavior, with a predisposition for visceral and central nervous system sites over bone (Bozkurt et al., 2024).

Cutaneous metastases occur in up to 23.9% of patients with breast cancer, but scalp involvement is exceptionally rare, and often underdiagnosed due to its subtle presentation (Yuet al., 2024; Liu et al., 2020). In patients with BRCA1 mutations, the risk of early, aggressive recurrence is amplified. Here, we describe a rare case of isolated scalp metastasis in a young BRCA1-positive woman with TNBC and poor pathological response to neoadjuvant therapy.

Case Presentation

A 37-year-old unmarried, nulligravid woman (weight: 77.8 kg) with no sexual history presented in December 2023 with a tender lump in the right breast. She denied systemic symptoms, nipple discharge, or visible skin changes. Her past medical history included bronchial asthma and confirmed allergies to betadine, amoxicillin, and chemotherapy. Family history was significant: her mother had breast cancer at age 53 (currently alive), and three maternal aunts died in their 40s from ovarian cancer.

Clinical examination revealed a T3N0 lesion. Ultrasound imaging showed an irregular, invasive lesion highly suspicious for malignancy. MRI revealed a BI-RADS VI mass with multiple satellite lesions and suspicious right axillary lymph nodes. Core biopsy confirmed triple-negative invasive breast carcinoma. BRCA1 mutation was detected; BRCA2 was negative. Staging investigations in February 2024, including a whole-body bone scan and CECT thorax- abdomen-pelvis, showed no evidence of metastasis. The patient received eight cycles of neoadjuvant chemotherapy.

In October 2024, she underwent right nipple-sparing mastectomy with axillary clearance, extended latissimus dorsi flap reconstruction, and breast implant placement. Postoperatively, 500mL of seroma was aspirated under ultrasound guidance. Histopathological analysis revealed no response to chemotherapy, with moderate residual tumor cellularity. Resection margins were free of malignancy. Four out of seventeen axillary lymph nodes were positive. The pathological stage was reported as ypT2(2)N2a.

Postoperatively, 500 mL of seroma was aspirated under ultrasound guidance. Histopathological analysis revealed no response to chemotherapy, with moderate residual tumor cellularity. Resection margins were free of malignancy. Four out of seventeen axillary lymph nodes were positive. The pathological stage was reported as ypT2(2)N2a.

In January 2025, she developed a new, tender lump on her scalp with associated headache. The lesion was firm, non-discharging, and unchanged in size over time. CECT brain imaging (March 2025) revealed a 2.6 × 0.9 × 1.9 cm subaponeurotic enhancing soft tissue lesion involving the bilateral posterior parietal regions, abutting the outer table of the calvaria with subtle erosion, but no intracranial extension. Tc99m whole-body bone scintigraphy in April 2025 did not show additional metastatic lesions.

Given the imaging findings suggestive of metastasis, surgical excision of the scalp mass with bone was performed.Defect size was 6* 6 cm. Bone defect was filled with titanium mesh . The soft tissue defect was closed with a rotational flap. The excised tissue has been sent for histopathological analysis; results are awaited.The patient was followed up the clinic and surgical sites healed well.

Discussion

Scalp metastasis is a rare form of cutaneous spread in breast cancer. Most cases occur in patients with advanced disease and often accompany other systemic metastases (Costa et al., 2017; Liu et al., 2020). However, isolated scalp metastasis, as in this case, has been reported infrequently and may represent an early sign of recurrence.

TNBC is known for aggressive behavior and early visceral spread. Dent et al. (2008) demonstrated that TNBC patients are four times more likely to experience visceral metastasis in the first five years post-diagnosis compared to other breast cancer subtypes. BRCA1 mutations, often associated with basal-like TNBC, confer further risk of early metastasis and poor response to chemotherapy (Kennedy et al., 2020).

Residual tumor post-neoadjuvant chemotherapy, as seen in this patient, is a strong predictor of poor prognosis (Alizadeh et al., 2018). Scalp lesions may mimic benign dermatologic conditions, leading to diagnostic delays. In this case, prompt imaging revealed characteristic features of a subaponeurotic metastatic lesion with subtle bone involvement but no intracranial extension—typical of cutaneous breast cancer metastases (Wu et al., 2024).

While histopathology is pending, the imaging findings and the patient's high-risk profile support the clinical suspicion of metastatic disease. PET/CT may offer further utility for assessing residual disease or other occult metastases (Liu et al., 2020).

Conclusion

This case underscores the need for high clinical suspicion when evaluating new scalp masses in breast cancer patients, particularly in those with TNBC, BRCA1 mutations, and residual disease post-neoadjuvant therapy.surgical excision and reconstruction can be done in single stage . Surgical excision provided tissue for histological confirmation and symptom relief. Final diagnosis awaits histopathology, but this rare presentation highlights the importance of comprehensive metastatic surveillance in high-risk subgroups.

Consent for publication

Informed written consent for publication and accompanying images was obtained from the patients prior to collecting information.

Availability of data and material

All data generated or analyzed during this study are included in this published article.

Competing interests

The authors declare that they have no competing interests.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

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Case-Based Review

Managing HIV in Burn Patients in Low to Middle-Income Countries

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Abstract

Burn injuries in people living with HIV (PLHIV) raise several unique challenges beyond the standard trauma-infection framework. Despite viral suppression with antiretroviral therapy, patients remain immunologically vulnerable in the context of extensive burns, which disrupts cutaneous and mucosal barriers and triggers systemic inflammation. We report a fatal case of a Sri Lankan HIV- positive patient with 60% burns, highlighting the challenges and strategies for virology-centered care.

Keywords:HIV,Burns,ART, Immunosuppression, LMIC

Background

HIV infection in severe burn patients provides a unique set of challenges in low to middle-income countries (LMIC). Burn trauma compromises cutaneous and mucosal barriers, inducing systemic inflammation and triggering cascades that promote viral reactivation. Sri Lanka has a very low prevalence of HIV, which is below 0.1% (NSACP, 2025). Guidelines from the STD/AIDS Control Programme (NSACP, 2022) elaborate on the ART continuity and opportunistic infection monitoring, but specific management in burn patients has not been explicitly mentioned.International literature suggests increased mortality, prolonged hospitalization, and high susceptibility to superinfections in HIV-positive burn patients. (Forrester et al, 2016). This case emphasizes the practical challenges faced by resource-constrained environments and highlights virology-centered scalable solutions to improve outcomes in burn patients with HIV.

Case Presentation

A 41-year-old, Sri Lankan male, with a history of methamphetamine abuse, HIV infection, and chronic psychiatric illness, was admitted to the Base Hospital, Homagama, with 60% TBSA self-inflicted thinner burns involving the neck, upper and lower limbs, genitalia, and face. Initial burn debridement was performed at the Base Hospital, Homagama.

On post-burn day 3, he left against medical advice and got admitted to the National Hospital of Sri Lanka. Following admission to the NHSL burns unit, he had continuous fever spikes, with elevated inflammatory markers (CRP 355 mg/L), and he was started on piperacillin-tazobactam. He was later escalated to meropenem, and following identification of *Acinetobacter baumannii* in both line and peripheral blood cultures, to IV colistin and oral metronidazole. He was also on olanzapine for his chronic psychiatric illness. His renal function remained stable. There was evidence of leukopenia and anemia (WBC 2.85 × 10^9/L, hemoglobin 9.5 g/dL), and coagulation parameters were slightly deranged (PT 19, INR 1.8, APTT 54.6 seconds). Electrolytes remained within the acceptable range. He was continued on a first-line antiretroviral therapy (ART) regimen comprising tenofovir disoproxil fumarate (TDF), lamivudine (3TC), and dolutegravir (DTG), consistent with national guidelines for HIV management in Sri Lanka, with a CD4 count <600 cells/mm^3, with continuous monitoring by the venereology team at NSCAP.

On post-burn day 9, the patient complained of dysphagia and hoarseness. Despite supportive care, his condition deteriorated. The patient died on post-burn day 12, due to sepsis and multi-organ failure, despite resuscitation attempts.

Discussion

This case highlights several key virological considerations. There are general management guidelines for HIV, developed by NSCAP, but there are no specific protocols for managing burn patients with HIV. Although delayed airway manifestations from inhalation injury can occur, his late onset of dysphagia and hoarseness raises concerns of viral esophagitis and laryngitis, particularly CMV or HSV. In such immunocompromised patients, opportunistic infections should be considered early (Agudelo Higuita et al, 2019). In infections requiring nephrotoxic antimicrobial agents, monitoring renal function is essential as per NSCAP recommendations. (NSACP OI Guidelines,2022).

In the Sri Lankan setting, the integration of virological expertise into burn care remains an area with untapped potential. Limited virology input at critical decision-making points and a lack of burn- specific virology protocols or standard operating procedures (SOPs) can hinder the proper management of virological conditions in burn patients.

Addressing these challenges requires multiple pragmatic solutions. Protocols for managing HIV in burn patients should be developed. Virological input, along with venereology consultation, must be incorporated from the point of admission. HIV-positive burn scenarios deserve inclusion in national guideline revisions. Implementing these strategies can significantly enhance the outcome of burn patients with HIV in LMIC settings.

Acknowledgements

We acknowledge the contributions of the NHSL Burns Unit staff, the NSACP venereology team, the NHSL Department of Microbiology, and the NHSL Department of Psychiatry for their multidisciplinary efforts.

Funding

No specific funding was received for this work.

Authors' Contributions

The first author conceived the study and wrote the manuscript. All authors contributed to the literature review, clinical data analysis, and approved the final version.

Ethics and Consent

Consent from next-of-kin could not be secured; however, all identifying details have been removed.

Competing Interests

The authors declare no competing interests.

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Case Report

Non-Invasive Nail Plate Clip Traction for Intra-Articular Thumb Interphalangeal Fracture with Extensor Tendon Injury

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Abstract

Intra-articular fractures of the thumb interphalangeal (IP) joint with concurrent extensor tendon laceration present a rare and complex challenge. Conventional methods such as transosseous K-wire fixation or external traction frames may be contraindicated in cases with soft tissue compromise. We report a case in which a novel, non-invasive traction technique using a nail plate clip was employed following surgical tendon repair. Early outcomes demonstrated effective articular alignment and preserved skin integrity. This method may offer a practical alternative to traditional skeletal traction systems in select cases.

Introduction

Fractures involving the thumb IP joint are uncommon, particularly when complicated by soft tissue injury such as extensor tendon laceration. Traditional fixation methods including percutaneous K-wires or external skeletal distractors—carry risks such as pin tract infection, soft tissue irritation, or interference with tendon healing.

While traction methods such as dynamic external fixation have been used effectively in other phalangeal and metacarpal injuries (Schuind et al., 1988), reports of non-invasive traction in the thumb IP joint remain sparse. Here, we describe a modified traction approach using a nail plate clip in the acute postoperative setting.

Case Presentation

A 30-year-old right-hand-dominant male presented to the emergency department with a traumatic injury to the right thumb following an angle grinder accident. Examination revealed a deep laceration over the dorsal IP joint and complete loss of active extension.

Radiographs confirmed an intra-articular fracture of the distal phalanx involving the IP joint, with minimal displacement and no subluxation.

Management and Technique

The patient underwent surgical repair of the extensor tendon under appropriate anesthesia. To maintain joint alignment and fracture distraction without the need for skeletal fixation, a non-invasive method was employed:

• A surgical-grade metal clip was adhered to the nail plate using cyanoacrylate adhesive.

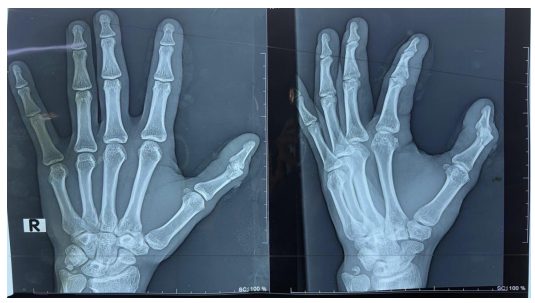

Fig.1: Preoperative radiograph showing intra-articular fracture of the distal phalanx at the thumb IP joint.

• Elastic bands were attached from the clip to a dorsal thermoplastic orthosis, applying continuous
longitudinal traction in extension.

• The splint was molded to the forearm and hand, stabilizing the thumb in a neutral to slightly extended position.

This construct preserved soft tissue integrity and allowed dynamic adjustment of tension without additional
surgical intervention.

Early Outcome (Day 5)

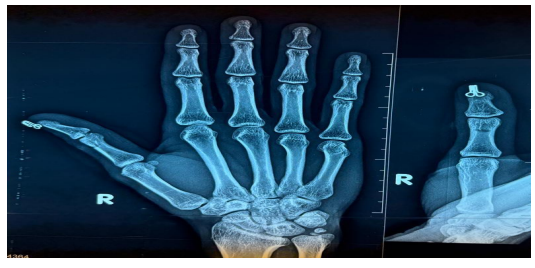

Fig.2: Day 5 post operative radiograph demonstrating maintained reduction and joint alignment

Five days post-application:
• The patient reported no pain or discomfort.
• The surgical site and nail bed showed no signs of ischemia, ulceration, or adhesive-related damage.
• Radiographs demonstrated maintained alignment of articular fragments and satisfactory reduction.
• No loosening or mechanical failure of the traction system was observed.

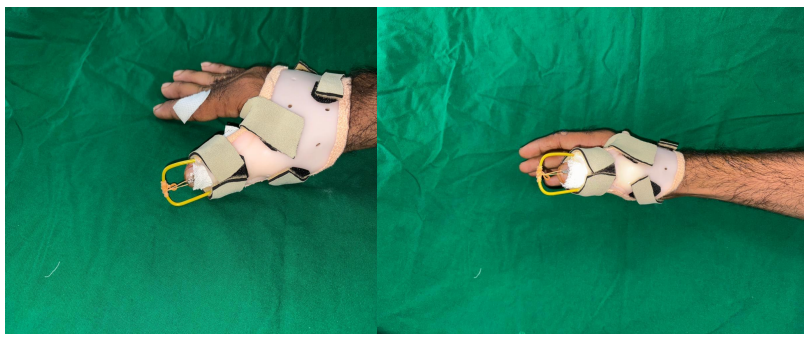

Fig.3: Clinical image of non-invasive nail plate clip traction construct in situ on Day 5

Discussion

The concept of dynamic or static traction using external devices has been successfully applied in metacarpal and phalangeal fractures (Schuind et al., 1988). In that study, a triangular external fixator provided prolonged traction, preserving articular congruity while minimizing soft tissue disturbance. Similarly, the present case
employed tension-based alignment without invasive fixation, representing a potential extrapolation of external traction principles into non-invasive thumb IP management.

This method may be particularly useful in acute settings where infection risk, patient comorbidities, or limited resources preclude conventional skeletal traction. Compared to K-wire or mini-external fixator constructs, this approach avoids transcutaneous entry points and may reduce risk of pin site complications and iatrogenic damage to surrounding structures.

Conclusion

This case demonstrates the potential of a non-invasive nail plate clip traction method in managing intra- articular thumb IP fractures complicated by extensor tendon injury. The early radiological and clinical outcomes suggest that this technique may be a viable alternative in select cases, particularly when minimizing soft tissue insult is prioritized. Further evaluation is required to assess long-term joint congruity, tendon healing, and functional recovery.

Consent for publication
Informed written consent for publication and accompanying images was obtained from the patients prior to collecting information.

Availability of data and material
All data generated or analyzed during this study are included in this published article.

Competing interests
The authors declare that they have no competing interests.

Funding
The authors received no financial support for the research, authorship, and/or publication of this article.

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Case Report

Successful Salvage of an Anterolateral Thigh Free Flap in a Septic Patient Under Noradrenaline Support

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Abstract

Perioperative hemodynamic instability and sepsis pose major challenges to microvascular free tissue transfer. Traditionally, vasopressors have been avoided during free flap reconstruction due to concerns of vasoconstriction and flap ischemia. However, emerging evidence suggests that norepinephrine may safely maintain systemic perfusion without compromising flap viability. We report a case of successful salvage of an anterolateral thigh (ALT) free flap in a septic, hypotensive patient who required continuous perioperative norepinephrine infusion. This case reinforces the evolving paradigm that controlled vasopressor use can be compatible with free flap survival, even in critically ill patients.

Introduction

Free tissue transfer is a cornerstone of modern reconstructive surgery, providing durable coverage for extensive scalp and cranial defects. The success of such procedures depends on stable systemic perfusion and uncompromised microcirculatory flow. Sepsis and hypotension, however, complicate intraoperative management and may jeopardize flap survival.

Historically, the intraoperative use of vasopressors was discouraged due to fear of vasoconstriction-induced ischemia. Recent clinical studies, however, have challenged this dogma, demonstrating that norepinephrine can maintain adequate mean arterial pressure (MAP) and even enhance flap perfusion when used judiciously. Randomized and observational studies have shown that norepinephrine neither increases the risk of flap failure nor reduces microvascular blood flow [(Eley et al., 2012); (Rajan et al., 2019); (Gardner et al., 2021); (Lee et al., 2023); (Ehrl et al., 2024); (Anker et al., 2019)].

This report presents a complex case of successful ALT free flap salvage in a patient with recurrent meningioma and perioperative sepsis managed with continuous norepinephrine infusion.

Case Presentation

A 44-year-old female with a history of multiple meningiomas underwent excision of an en-plaque meningioma in 2012 involving the left zygomatic and frontoparietal regions. On 12 February 2025, she underwent re-excision of a recurrent meningioma with cranioplasty using a PEEK prosthesis.

Her postoperative course was complicated by a surgical site infection initially due to Methicillin-resistant Staphylococcus aureus (MRSA), later superinfected with Pseudomonas aeruginosa, resulting in prosthesis exposure. On 23 July 2025, the infected PEEK plate was removed and the wound debrided, leaving a large scalp and calvarial defect**.**

Subsequently, on 31 July 2025, an anterolateral thigh (ALT) free flap with an interpositional saphenous vein graft was performed for scalp and calvarial coverage. The procedure lasted approximately 13 hours with an estimated blood loss of 600 mL.

Perioperative Hemodynamics:

The patient presented with early sepsis and persistent hypotension, along with T-wave inversions on ECG. Despite aggressive fluid resuscitation, blood pressure remained low, prompting initiation of continuous low-dose intravenous norepinephrine intraoperatively, which was continued postoperatively. Mean arterial pressure was maintained around 100 mmHg throughout surgery and recovery.

Postoperative Course:

The patient was extubated on postoperative day (POD) 2 with gradual hemodynamic stabilization. On POD 4, she developed Klebsiella pneumoniae septicemia (carbapenemase-producing strain), necessitating escalation of antibiotic therapy. Norepinephrine was tapered and discontinued by the end of the second postoperative week.The flap remained viable with excellent capillary refill and no evidence of venous congestion or necrosis. At two weeks postoperatively, the patient was alert (GCS 15/15), hemodynamically stable, and had healthy flap coverage.

Discussion

This case highlights the successful use of norepinephrine during free flap reconstruction in a patient with sepsis and hemodynamic instability.

Traditional teaching cautioned against vasopressor use due to concerns of vasoconstriction, compromised pedicle flow, and increased risk of thrombosis. However, contemporary evidence suggests otherwise.

In a randomized controlled trial, Eley et al. (2012) demonstrated that norepinephrine increased free flap blood flow compared with epinephrine and dopexamine. Rajan et al. (2019) similarly reported no adverse outcomes in 120 free flap cases involving perioperative norepinephrine. Gardner et al. (2021), in a large cohort study, confirmed that intraoperative vasopressor use did not increase reoperation or flap failure rates.

Further supporting evidence comes from controlled trials and physiologic studies. Lee et al. (2023) found that norepinephrine preserved perfusion more effectively than phenylephrine in breast free flaps, while Ehrl et al. (2024) prospectively demonstrated that postoperative norepinephrine infusion did not impair microvascular flow in 105 patients. Anker et al. (2019) showed through indocyanine green perfusion imaging that vasopressor-dominated hemodynamic support resulted in
comparable flap perfusion to fluid-heavy strategies in DIEP flap surgery, and excessive fluid administration was more detrimental.

These findings align with the current trend toward balanced hemodynamic management — emphasizing moderate fluid restriction with controlled vasopressor support to avoid interstitial edema and venous congestion, both of which can compromise flap perfusion. Our patient's excellent flap survival under continuous norepinephrine support, despite systemic
sepsis, supports this evolving paradigm. Judicious vasopressor use appears not only safe but essential to maintaining adequate perfusion pressure in critically ill reconstructive patients.

Conclusion

This case illustrates that norepinephrine can be safely administered during free flap surgery even in septic and hemodynamically unstable patients. When used within a controlled hemodynamic framework, norepinephrine ensures stable perfusion without compromising flap viability. Along
with meticulous surgical technique, infection control, and fluid balance, vasopressors such as norepinephrine should be considered a vital component of perioperative management in complex free flap reconstruction.

Funding
No specific funding was received for this work.

Authors' Contributions
The first author conceived the study and wrote the manuscript. All authors contributed to the
literature review, clinical data analysis, and approved the final version.

Ethics and Consent
Consent from next-of-kin could not be secured; however, all identifying details have been removed.

Competing Interests
The authors declare no competing interests.

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