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Case report

Successful pregnancy and delivery after post burn abdominal wall reconstruction using tensor fascia lata fasciocutaneous flap and split-thickness skin graft: A case report

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ABSTRACT

Introduction: Abdominal wall contractures following burn injuries can cause both maternal and fetal complications during pregnancy like maternal disfigurement, breathing difficulties, scar site pain, fetal distress, premature labor, scar breakdown, and keloid formation.

Case presentation: A 26-year-old female presented with second-degree flame burns to her anterior abdomen, perineum, and bilateral proximal thighs, resulting in 18 % TBSA involvement from a cooking accident. She received debridement, wound care, and supportive treatment, and was discharged in improved condition. Four years later, she developed significant abdominal wall scarring with umbilical retraction and thigh contractures, limiting thigh abduction. Contracture release and abdominal wall reconstruction with bilateral fascia lata faciocutaneos flaps and split-thickness skin grafts were performed. The patient later had a successful pregnancy with normal delivery, experiencing no complications except mild stretching sensations at the surgical site.

Discussion: Burn in the perineum is rare due to its protected location, making perineal contracture uncommon. While one case documented severe contractures affecting both the trunk and perineum, leading to fetal distress and emergency cesarean, our patient experienced similar contractures but had successful surgical release and autologous abdominal wall reconstruction prior to pregnancy, avoiding complications. Various surgical options, including expansion abdominoplasty, modified abdominoplasty, and anterolateral thigh flaps, have proven effective in improving outcomes for pregnant women with post-burn abdominal contractures.

Conclusion: An individualized approach is crucial, as evidenced by our use of tensor fascia lata faciocutaneous flap and split-thickness skin grafts, improving both maternal and fetal health.

1. Introduction

Abdominal wall contractures following burn injuries present significant challenges to both maternal and fetal health, particularly in women who become pregnant after suffering severe burns often resulting in failure of the scar to expand, leading to uterine displacement. This can cause maternal disfigurement, breathing difficulties, and pain, and, in some cases, scar break down particularly during the third trimester [1,2]. Additionally, there may be an increased risk of premature labor, fetal distress, fetal death, and pressure deformity [3]. Cases in the literature have also reported the exacerbation and recurrence of keloids and hypertrophic scars during pregnancy. While it is hypothesized that hormonal changes may promote scar growth, there is insufficient evidence to substantiate this hypothesis. [4,5]

The present case report describes the successful transvaginal delivery of a patient who underwent contracture release and autologous abdominal wall reconstruction using a tensor fascia lata (TFL) fasciocutaneous flap and split-thickness skin graft prior to pregnancy. This report aims to highlight the importance of early surgical intervention in managing abdominal contractures in a woman of childbearing age,

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demonstrating that appropriate pre-pregnancy surgical management can lead to successful outcomes during labor and delivery. The work has been reported in line with the SCARE criteria [6].

2. Case presentation

The patient was a 26-year-old female with a deep partial thickness flame burn covering her entire anterior abdomen, perineum (including



Fig. 1. Shows the initial scar.

mons pubis, bilateral proximal third of labia majora), and bilateral proximal third of the anterior thighs, totaling about 18 % (TBSA) total body surface area from a cooking incident. Immediate treatment included supportive measures, debridement, wound care, and physiotherapy. She was discharged in improved condition and continued follow-up at our hospital.

Four years after the injury, the patient returned with a significant abdominal wall scar involving the perineum in the way that it retracted the umbilicus down to the level of the symphysis pubis, and another one just 5 cm below the pubic tubercle extending from the mons pubis and proximal 1/3 of the labia majora to the proximal right medial thigh restricting her from abducting her right thigh as shown in Fig. 1.

After a thorough preoperative evaluation, the patient was taken to the operating room. Under general anesthesia, a transverse incision was



Fig. 2. Shows the exposed area after contracture release.

made to release the scar from the symphysis pubis, allowing the tethered umbilicus to return to its normal position. The procedure exposed the hypogastric and bilateral iliac regions, devoid of skin and subcutaneous tissue, as shown in Fig. 2. A bilateral lateral thigh pedicled tensor fascia lata (TFL) fasciocutaneous flap was then developed and rotated 180 degrees to cover the exposed area. The flap measured 10 cm in width and 18 cm in length, tapering toward the end. The donor site was closed primarily, and a split-thickness skin graft taken from the right anterior thigh was used to cover a 5 cm by 5 cm area on the right lumbar region of the abdomen, the left inguinal area, and the proximal part of the anterior thigh with final outcome as seen in Figs. 3 and 4. A bilateral drain was placed within the thigh regions, spanning the entire length of the flaps on each side. Following a 4-week hospital stay, the patient was discharged with the ability to abduct her right thigh after the successful release of the contracture and reconstruction of the abdominal wall, with a follow-up at our hospital.

Subsequently, the patient had a successful pregnancy and transvaginal delivery at 40 weeks of gestational age as shown in Fig. 5, 21



Fig. 3. Shows the outcome of reconstruction at the end of the surgery.



Fig. 4. Shows 3rd post-operative day picture after reconstruction.

months after surgical reconstruction. She experienced no significant complications aside from mild stretching sensations during pregnancy. Postpartum evaluations showed an intact flap with no signs of abdominal wall hernia or bulging, and the neonate also had no complications. Upon discharge, she was advised to have multidisciplinary follow-up for her future pregnancies.

3. Discussion

Burn in the perineum region is uncommon because of its



Fig. 5. Shows the final out-come during pregnancy.

anatomically protected location, making perineal contracture a rare consequence [7]. To our knowledge, only one case report has documented this rare combination of post-burn contractures affecting both the abdomen and perineum, leading to fetal distress and necessitating an emergency cesarean section along with the surgical release of the contractures [8]. Adequate infra-umbilical skin flexibility is crucial for delivery. A cesarean section is recommended if scars cover 50 % or more of this area, in cases of fetal distress, or if the mother experiences severe abdominal pain. [9]. Our patient also had post-burn contractures in both her abdomen and perineum. However, due to the successful release of these contractures and autologous abdominal wall reconstruction prior to pregnancy, she did not encounter any complications during or after her pregnancy, nor did she have an indication for cesarean delivery.

Various surgical interventions have been explored to improve outcomes in women of childbearing age with post-burn abdominal contractures, with autologous tissue reconstruction being a viable option. Successful outcomes have been reported from approaches like expansion abdominoplasty, modified abdominoplasty, and the anterolateral thigh flap [10–13]. These procedures significantly enhance maternal comfort and promote positive fetal outcomes in women with post-burn abdominal wall contracture.

A recent literature review emphasized the need for an individualized approach in managing burn scar contractures to effectively reduce both the associated costs and morbidity in burn patients [14]. We believe abdominal wall reconstruction using TFL fasciocutaneous flap in combination with split-thickness skin grafts not only address the structural deficits but also contribute to functional recovery, facilitating a more favorable environment for both the mother and the fetus.

4. Conclusion

Our case illustrates that pre-pregnancy surgical intervention for the release of post-burn contractures and abdominal wall reconstruction using a TFL fasciocutaneous flap and split-thickness skin graft can offer a viable solution for women in childbearing age facing the challenges of burn sequelae. Further studies and long-term follow-up are required to better understand the optimal timing and techniques for such interventions and their long-term impact on maternal and fetal health.

Author contribution

BAA: Writing – original draft, Conceptualization. **AGG**: Writing – review & editing, Visualization, Conceptualization. **AGA**: Writing – review & editing. **SBW**: Writing – review & editing. **MMB**: Writing – review & editing, **GAW**: Writing – review & editing.

Informed consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor- in -Chief of this journal on request.

Ethical approval

This case report is exempt from the requirement of ethical approval from the University of Gondar College of Medicine and Health Science.

Guarantor

Dr. Bethlehem Aliye Asfaw, M.D.

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Conflict of interest statement

None.

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