



CHALLENGES IN MANAGING CLEFT LIP PATIENTS IN THE GAZA STRIP DURING WARTIME: A CASE SERIES

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ABSTRACT

Background: Cleft lip is a common congenital anomaly that requires timely surgical intervention to optimize functional and aesthetic outcomes. Delayed repair can lead to feeding difficulties, speech and language delays, and increased risk of postoperative complications. In conflict-affected regions, such as Gaza, disruptions in healthcare access further exacerbate these challenges. This study presents a case series of delayed cleft lip repairs and associated outcomes in a resource-limited setting. **Methods:** A retrospective review of 12 pediatric patients with cleft lip anomalies was conducted. Data on demographics, clinical presentation, surgical intervention, and postoperative outcomes were analyzed. Patients were evaluated for preoperative investigations, intraoperative complications, and postoperative recovery. **Case presentation:** Twelve infants (7 males, 5 females) aged 4 to 18 months were included. Nine patients (75%) underwent surgical repair, while three (25%) had surgery canceled due to respiratory findings, including bilateral lung infiltrates and patchy consolidation. Among those operated on, two (22%) had cheiloplasty using the anatomic subunit repair technique, while seven (78%) underwent cheiloplasty in addition to primary rhinoplasty. No intraoperative complications were noted, but postoperative issues included alar cinch suture failure due to trauma, croup, and dressing-related dermatitis. All completed procedures had successful outcomes. **Conclusion:** Delayed cleft lip repair in conflict-affected settings poses significant challenges, including increased postoperative complications and limited healthcare accessibility. Timely intervention remains critical for optimal functional and aesthetic results. Strategies to improve healthcare infrastructure and surgical access are necessary to mitigate delays and associated complications.

KEYWORDS: Cleft lip, Delayed surgical repair, Plastic and Reconstructive surgery, War-related healthcare challenges, Gaza healthcare crisis.

INTRODUCTION

Cleft lip is one of the most common congenital anomalies in the world, with genetic and environmental factors playing a significant role in its development.^[1] The annual prevalence of cleft lip with or without cleft palate is 10 in 10,000.^[2] Children with cleft lip may face critical speech, hearing, nutrition, mental and social developmental problems.^[3] The condition has a complex genetic bases, shaped by both gene-gene or gene-environment interactions. This leads to two main types: syndromic and non-syndromic orofacial clefts.^[4] Optimal management of cleft lip requires a multidisciplinary team involving plastic surgeons, orthodontists, anesthesiologists, and other specialists.^[5] Early intervention, including nasoalveolar molding (NAM) and on time surgical repair, is important for desired outcomes.^[6] There is also a critical need for public healthcare providers' intervention to educate people

about the causes and management of this condition which will help in the improvement of the outcomes.^[7]

However, in war zones like Gaza, war-related destructions severely affect healthcare accessibility, delaying surgical interventions and increasing the risk of complications.^[8] The healthcare crisis in Gaza has led to significant challenges in providing essential medical services.^[9] Many reports indicated that a large number of hospitals and healthcare centers have been destroyed, limiting the capacity to address routine and emergency medical needs.^[10] The blockade resulted in critical lack of medical supplies, electricity and clean water which lead to delays in healthcare delivery.^[11] The lack of medical doctors and nurses, supplies and damaged healthcare facilities disturb on time and effective treatment delivery. The impact of war in Gaza's healthcare system has been great, with several attacks on health facilities and medical staff.^[12] In this context,

managing congenital anomalies like cleft lip becomes more challenging. Affected infants may experience delays in surgical repairs, leading to potential complications.

In this case series, we present 12 cases of delayed repair of cleft lip in children.

Case presentation

Case 1

A 10-month-old male infant with no significant medical or surgical history and a negative family history presented for surgical correction of a left-sided incomplete isolated cleft lip. The clinical examination was unremarkable, and preoperative investigations, including a complete blood count (CBC), kidney function tests (KFT), prothrombin time (PT), international normalized ratio (INR), and chest X-ray (CXR), were all within normal limits. The patient underwent anatomic subunit repair with primary rhinoplasty under general anesthesia. The procedure had no intraoperative or postoperative complications.

Case 2

A 6-month-old male with no significant medical, surgical, or family history underwent anatomic subunit repair with primary rhinoplasty for a right complete cleft lip and palate. Preoperative investigations including CBC, KFT, PT, INR, and CXR were unremarkable. The surgery was completed without intraoperative complications. However, ten days postoperatively the patient presented with upper lip swelling and a history of facial trauma three days after surgery which caused epistaxis. On examination, the columella was deviated to the left, and the right nostril appeared widened due to recent trauma leading to the failure of the alar cinch suture.

Case 3

A 9-month-old female with no significant medical, surgical, or family history underwent anatomic subunit repair for a left microform cleft lip. Preoperative investigations including CBC, KFT, PT, INR, and CXR were unremarkable. The surgery was completed without intraoperative complications and the postoperative course was uneventful.

Case 4

An 18-month-old male with no significant medical, surgical, or family history underwent anatomic subunit repair with primary rhinoplasty for a bilateral incomplete cleft lip. Preoperative investigations, including CBC, KFT, PT, INR, and CXR, were unremarkable. The surgery was completed without intraoperative complications. Postoperatively, the patient developed contact dermatitis related to the dressing.

Case 5

An 18-month-old male with no significant medical, surgical, or family history underwent anatomic subunit

repair with primary rhinoplasty for a right incomplete isolated cleft lip. Preoperative investigations including CBC, KFT, PT, INR, and CXR were unremarkable. The surgery was completed without intraoperative complications and the postoperative course was uneventful.

Case 6

A 9-month-old male with no significant medical, surgical, or family history presented for surgical repair of a right incomplete isolated cleft lip. On examination, he had a bilateral wheezy chest, leading to the cancellation of the operation. Investigations showed an elevated WBC on CBC, while KFT, PT, and INR were unremarkable. A chest X-ray revealed bilateral lung infiltrates.

Case 7

A 4-month-old male with no significant medical, surgical, or family history underwent anatomic subunit repair with primary rhinoplasty for a left incomplete isolated cleft lip. Preoperative investigations, including CBC, KFT, PT, INR, and CXR, were unremarkable. The surgery was completed without intraoperative complications. On the first postoperative day the patient developed croup, which improved with medical therapy.

Case 8

A 6-month-old female with no significant medical, surgical, or family history presented for surgical repair of a left complete cleft lip and palate. On examination, she had a bilateral wheezy chest. Investigations showed normal CBC, KFT, PT, and INR, while a chest X-ray revealed bilateral lung infiltrates. Due to her condition the operation was cancelled.

Case 9

An 8-month-old female with no significant medical, surgical, or family history underwent anatomic subunit repair with Tajima rhinoplasty for a left complete cleft lip and palate. Preoperative investigations were unremarkable except for a low hemoglobin level of 7.8 which was against the general rule of 10 (at least 10 weeks of age, Hb >10 g/dl, and patients weight of 10 or more pounds). After discussing the possibility of further delaying surgery to improve hemoglobin levels, consent was obtained, and the procedure was done. The surgery was completed without intraoperative complications and the postoperative course was uneventful.

Case 10

A 12-month-old female with no significant medical, surgical, or family history presented for surgical repair of a right complete cleft lip and palate with a left incomplete cleft lip. Clinical examination was unremarkable, and preoperative investigations including CBC, KFT, PT, and INR, were normal. However, a chest X-ray revealed patchy consolidation in the right upper lobe leading to the cancellation of the operation.

Case 11

A 12-month-old female with no significant medical, surgical, or family history underwent anatomic subunit repair for a right microform cleft lip. Preoperative investigations, including CBC, KFT, PT, INR, and CXR, were unremarkable. The surgery was completed without intraoperative complications and the postoperative course was uneventful.

Case 12

A 4-month-old male with no significant medical, surgical, or family history underwent anatomic subunit repair with Tajima rhinoplasty for a left complete cleft lip and palate. Preoperative investigations, including CBC, KFT, PT, INR, and CXR, were unremarkable. The surgery was completed without intraoperative complications and the postoperative course was uneventful.

Summary of the cases

Twelve patients (7 males, 5 females) with cleft lip anomalies were included, with ages ranging from 4 to 18

months. Nine patients (75%) underwent surgical correction, while three (25%) had their operations canceled due to respiratory findings (bilateral lung infiltrates in two cases, right upper lobe patchy consolidation in one case). Among the operated patients, two (22%) had a cheiloplasty alone, while seven (78%) underwent additional primary rhinoplasty procedures.

Preoperative laboratory investigations were unremarkable in most cases, except for one patient (8%) with anemia (Hb 7.8 g/dL) and another (8%) with leukocytosis. No intraoperative complications occurred. Postoperative complications were observed in three patients (33% of those operated), including croup (resolved with medical therapy), alar cinch suture failure due to trauma, and dressing-related dermatitis. Overall, all completed surgeries were successful, with favorable outcomes. **Table 1** demonstrates a summary for all 12 cases and **(Figure 1)** shows images of different stages of surgical treatment for all 12 cases.

Table 1: Presentation, procedure, and clinical characteristics of all cases.

Case	Gender	Age	Presentation	Procedure	Outcome	Complications
1	Male	10 months	Left incomplete isolated cleft lip	Anatomic subunit repair with primary rhinoplasty	Successful	None
2	Male	6 months	Right complete cleft lip and palate	Anatomic subunit repair with primary rhinoplasty	Post-op trauma led to columella deviation and right nostril widening	Alar cinch suture failure due to trauma
3	Female	9 months	Left microform cleft lip	Anatomic subunit repair	Successful	None
4	Male	18 months	Bilateral incomplete cleft lip	Anatomic subunit repair with primary rhinoplasty	Successful	Contact dermatitis related to dressing
5	Male	18 months	Right incomplete isolated cleft lip	Anatomic subunit repair with primary rhinoplasty	Successful	None
6	Male	9 months	Right incomplete isolated cleft lip, bilateral wheezy chest	Operation cancelled	-	Bilateral lung infiltrates on CXR, elevated WBC
7	Male	4 months	Left incomplete isolated cleft lip	Anatomic subunit repair with primary rhinoplasty	Successful	Post-op croup improved with medical therapy
8	Female	6 months	Left complete cleft lip and palate, bilateral wheezy chest	Operation cancelled	-	Bilateral lung infiltrates on CXR
9	Female	8 months	Left complete cleft lip and palate, low Hb (7.8)	Anatomic subunit repair with Tajima rhinoplasty	Successful	None
10	Female	12 months	Right complete cleft lip and palate + left incomplete cleft lip	Operation cancelled	-	Right upper lobe patchy consolidation on CXR

11	Female	12 months	Right microform cleft lip	Anatomic repair	subunit	Successful	None
12	Male	4 months	Left complete cleft lip and palate	Anatomic repair with rhinoplasty	subunit with Tajima	Successful	None

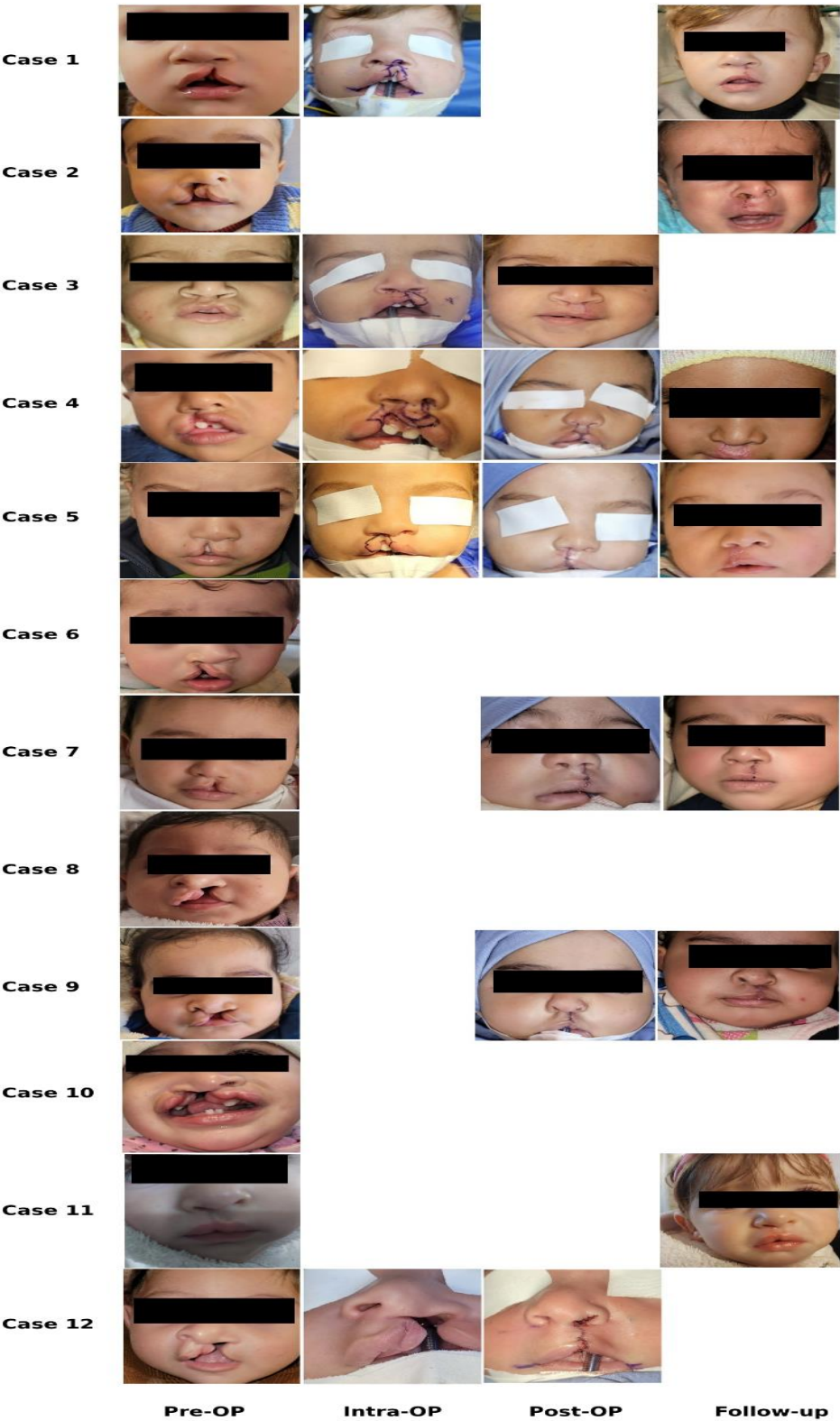


Figure 1: Preoperative, intraoperative, Postoperative and Follow-up images of the 12 cases that underwent delayed cleft lip repair.

DISCUSSION

Cleft lip is a common congenital anomaly which affects orofacial region, it can occur isolated or combined with other congenital deformities, in particular congenital heart diseases.^[13] The estimation of the overall worldwide prevalence of cleft deformities is one affected patient in every 600 newborn babies.^[1] Prenatal diagnosis of cleft deformities is important for the patients and their families, as it provides the identification of risk factors and guides on postpartum treatment, prognosis and recurrence risk.^[14]

Providing comprehensive care for patients with cleft lip requires a team approach. To address their medical, surgical, dental, orthodontic, and psychological needs effectively, specialists must collaborate in both diagnosis and treatments planning. Working together as a multidisciplinary team leads to the best outcomes for the patient efficiently and cost effectively.^[15] Lip, nose, and palate repairs are usually done during infancy. After surgery, careful monitoring is essential to detect any complications early. If needed, revisional procedures should be completed before the child starts primary school. As they grow, additional surgeries like alveolar bone grafting may be necessary.^[5] Delaying primary cleft lip repair due to limited awareness, socioeconomic factors, insufficient facilities, and less adherence to treatment guidelines can negatively affect proper management.^[16]

In this case series we present the delayed repair of several cleft lip cases due to war in Gaza. Delaying cleft lip treatment can lead to several complications, including feeding difficulties, speech and language delay, hearing problems, dental issues, and psychological challenges.^[17] Moreover, delayed surgical intervention may result in higher rates of wound dehiscence and infection.^[18] Therefore, timely surgical repair is essential to minimize these risks and provide optimal management and development. A study showed that some factors were associated with delay in cleft surgery such as, female gender, and bilateral cleft lip or syndromic diagnoses.^[19] A study conducted in Turkey examined immigrant pediatric patients with cleft lip, the study showed delays in treatment especially among patients with lower socioeconomic status.^[20]

While this study provides valuable insights into delayed cleft lip repair in a conflict zone, it has some limitations. The small sample size and retrospective nature mean our findings may not fully capture the broader challenges faced by all affected children. Additionally, we could not assess long-term outcomes like speech development, feeding difficulties, or the need for further surgeries. Future research should focus on larger groups of patients and follow them over time to understand the full impact of delayed treatment. Exploring solutions like mobile surgical teams, telemedicine for early screening, and international collaborations could help improve access to

timely care and reduce the burden of delayed interventions.

CONCLUSION

Delayed cleft lip repair in conflict-affected regions poses significant challenges, increasing the risk of complications and limiting access to timely surgical care. Despite these obstacles, successful outcomes were achieved in all completed surgeries. Strengthening healthcare infrastructure and implementing alternative solutions, such as mobile surgical units and telemedicine, are essential to improving access and reducing delays.

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