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Case Report Open Access

Reconstruction and Management of Traumatic Hemipelvectomy: A Case Report

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Abstract

Traumatic amputation refers to loss of a part or entire organ, such as limbs, ears, penis from the body by an accident or trauma. The extremities are important for numerous activities in our daily lives. Nutrition, movement and working are just a few of daily functions. Loss of an extremity is a destructive trauma with physical and psychological effects on the patient. In addition, it has serious economic consequences due to the loss of labor, health expenditures and rehabilitation process.

Keywords: Traumatic amputation; Hemipelvic

Introduction

Major amputations are serious life-threatening injuries, and a multidisciplinary approach reduces morbidity and mortality in major amputations from trauma [1-4]. Among those living with limb loss, the main causes are vascular disease (54%) – including diabetes and peripheral arterial disease – trauma (45%) and cancer (less than 2%) [5]. Approximately 185,000 amputations occur in the United States each year [6].

Lower extremity amputations account for 80-85% of all traumatic and non-traumatic amputation cases [7]. Management of amputations after trauma begins with first aid in emergency department and continues with reconstruction and rehabilitation process [8,9].

In this case report, we present emergency approach and reconstruction stages of a case with left hemipelvis amputation as a result of occupational accident.

Case Report

A 16-year-old male patient was admitted to the emergency room after his leg was trapped in a concrete mixer resulting in total amputation of half of his groin and pelvis. The first intervention was performed by the emergency and general surgery departments and the bleeding vessels were connected, shock of the patient was intervened and the patient was scheduled to be referred to an advanced center. Since the patient's general condition was poor and had major amputation, this referral process lasted 12 hours. The patient was brought to our center from a distance of 600 km away, at the 12th hour of the injury (Figure 1A).

There was no active bleeding of the patient whose general condition was moderate to poor with pulse 110/min, body temperature was 36.8°C, blood pressure was 90/50 mm HG. The intubated patient's cold ischemia time was approximately 12 hours. After the emergency department's examination, consultations and blood preparation; the patient was taken to the operating room by the plastic surgery department. Intraoperative examination of the patient revealed pelvic bone fractures, penis amputation, and partial scrotum defect; urethra was broken at 3cm from the bladder outlet, the rectum was intact but the neighbouringneighbouring left side wall and the adjacent muscles were absent, and the intestines were exposed due to amputation of the region, where the left lower quadrant adheres to the pelvis (Figure 1B). Multidisciplinary reconstruction was planned for the patient with high energy avulsionve injury. Pediatric surgery department was requested to open colostomy from left side because of the rectus flap to be removed after loop colostomy. On palpation, the rectum was evaluated as intact. The urine flow was controlled by a catheter inserted by the urology department. The bladder was visible in the area of injury, and there was no perforation. As the plastic surgery team, we also participated to the operation and first, we performed debridement of the necrotic tissues. Scrotum defect was repaired with local flaps. For the large defect in the penile urethra, the avulsedive urethral mucosa was re-shaped, wrapped to the catheter, passed through the scrotum, and anastomosed. Abdominal wall was first repaired with polyprolene mesh for the abdominal wall defect in which the intestines were exposed. Left vertical rectus abdominis muscle skin flap was used to reconstruct the defect (Figure 1C and 1D).

The patient was hospitalized in the intensive care unit for 3 days, was taken to the plastic surgery ward. The patient was re-operated because of urethral flap partial necrosis on the 20th postoperative day. The defect was repaired with a full-thickness skin graft. The patient was transferred to the Urology clinic for bladder-neck and urethral reconstruction on the 60th postoperative day. The patient underwent a prosthesis for left lower extremity at an outer center at 5th postoperative month (Table 1).

Discussion

Indications and contraindications for replantation have been specified in literature [10]. With today's therapeutic and technological advancements, the surgeon is capable of recovering vitality in the most severe lower leg injuries [11]. Although successful replantation is preferred for stump repair and prosthesis application, correcting viability by itself today is not sufficient to meet successful replantation criteria. The necessary criteria for successful replantation include A) excellent viability of the replanted part, B) there should be no serious systemic discomfort due to replantation, C) functional extremity, D) no or low level of pain in the replanted part E) Acceptable aesthetic result, F) An acceptable length for rehabilitation and G) social reintegration and return to normal [12,13]. Stump repair is preferred in patients

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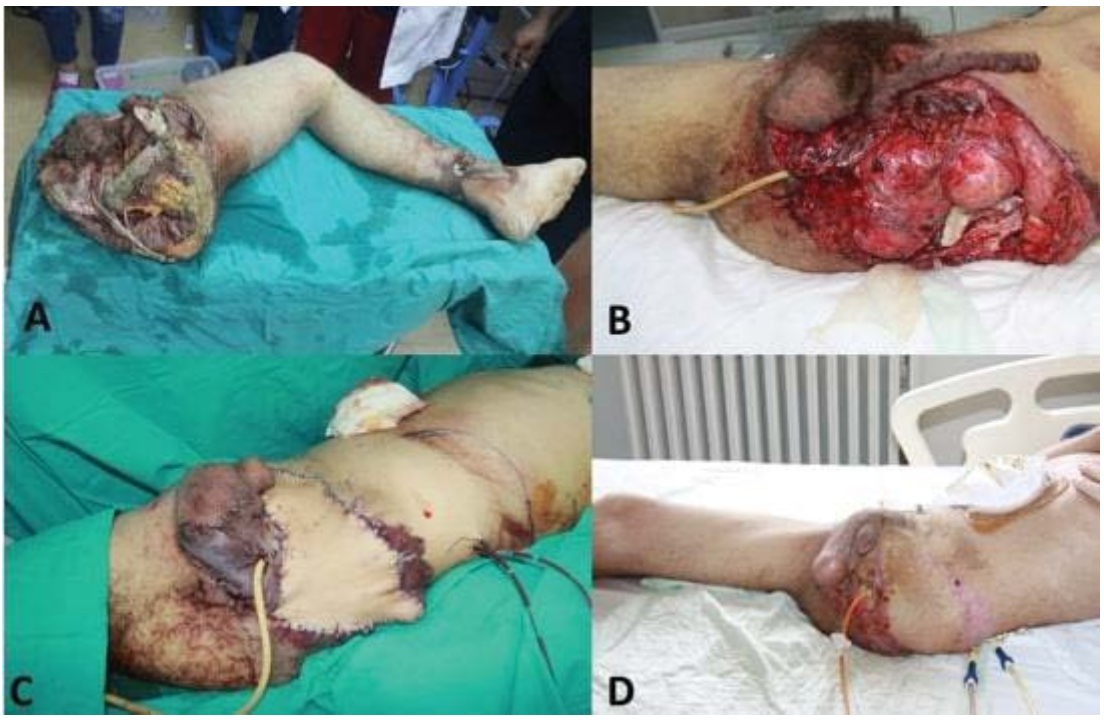

Figure 1: A) The view of the amputated limb in emergency department; **B)** preoperative view; **C)** early postoperative view; **D)** postoperative 1st month view.

Skeletal/soft tissue injury	
Low energy injury (eg. Simple bone fracture)	1 point
Medium energy injury (eg. Multiple bone fractures)	2 points
High energy injury (e.g. Car accidents)	3 points
Very high energy injury (e.g. High speed trauma with severe contamination	4 points
Limb ischemia	
Normal perfusion with reduces or even absent pulse	1[x] point
Absent pulse, paresthesia, diminished capillary refill	2 points
Cool paralysed, insensate limb	3[x] points
Shock	
Systolic blood pressure > 90 mm Hg	0 points
Hypotensive transiently	1 point
Hypotensive persistent	2 points
Age	
<30 years	0 points
30-50 years	1 point
>50 years	2 point

Note: [x] The score is doubled for ischemia >6 hours.

Table 1: Mangled extremity severity score (MESS).

whom successful replantation cannot be done or those who have a life threatening risk due to replantation. 'Life for Limb 'must be an ultimate guideline.

A patient scheduled for replantation of lower leg amputation, who has stable preoperative or intraoperative vitals, may have a risk of death due to serious fluid electrolyte imbalance, acute tubular necrosis and sepsis in the postoperative period due to the systemic circulation of muscle destruction products in the replanted extremity. The risk of replantation, which may cause local or systemic complications, should be carefully evaluated with preoperative diagnosis and intraoperative findings. General condition of the patient should not only tolerate a prolonged operation time, but should also should compensate for postoperative potential systemic effects of the revascularized lower leg. Large tissue damage, particularly muscle tissue, leads to local and systemic reactions [14,15].

One of the scoring methods used to determine indications for replantation in major lower extremity amputations is "The Mangled Extremity Severity Score" developed by Johansen et al. In this score, severity of the injury (Low energy: 1- Very high energy: 4), ischemia (pulse reduction: 1- Cold, paralytic, 6 hours past: 3), shock (Systemic blood pressure ≥ 9 mmHg: 0 -persistent hypotension: 2) and age (under 30 years: 0 - 50 years and older: 2) parameters are scored. In this scoring, direct amputation is recommended for scores of 7 or more [16], while our case had 11 points. Because the cold ischemia period was 12 hours and the patient's general condition was poor, stump repair was planned and applied with a multidisciplinary approach.

As a result, traumatic total lower extremity loss involving partial amputation of the urogenital and pelvic region is a challenge because of both patient factors such as permanent physiological and psychological sequelae, as well as reconstruction alternatives and multidisciplinary approach of multiple clinics. As in our case, surgical treatment should be planned with multidisciplinary approach considering life threatening risks in major amputations related to traumatic occupational accidents.

Conflict of Interests

The authors declare no conflict of interests.

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