Degloving Forearm Injury

Click on images to view larger radiographs and clinical pictures.

Introduction

This 24 year old woman was the belted driver of a car travelling at 100km/h on the highway. She had her left arm outside the driver's door window when she lost control of her car. With her arm still outside the car flipped onto its side and travelled 20-30 metres in this position. Paramedics found this patient with her hand trapped between the car door and the asphalt. She was evaluated according to ATLS protocols and this was found to be an isolated injury.

Pictures From the Trauma Room:

Trauma Room Radiographs:

How would you manage this patient now ?

Tetanus status was unknown, but the patient recalled that she had her series of tetanus toxoid when she was a child. She had no allergies, no history of renal dysfunction, and did not take any medication. A detailed hand examination was carried out as part of the secondary survey. Sensation was found to be intact in the Median, and Ulnar nerve distribution. Motor function for all three nerves was intact. There was no sensation to the radial side of the thumb which (see picture) had a hemi-degloving type injury. Radial and Ulnar pulses were present, and there was no evidence of an acute Carpal Tunnel syndrome. There were no injuries to the left upper extremity proximal to the forearm.

What is the appropriate management now ?

0.5cc of Tetanus Toxoid was given, and the patient was also given 1g of Ancef, 40mg of Gentamycin, and 1.5 milion units of Penicillin. After informed consent was obtained, the operating room was booked for an urgent irrigation & debridement of this patient's hand. Limb salvage was considered to be possible given the intact perfusion and neurological function. A staged procedure was felt to be the best option

What would the best management be for the second stage ?

There was extensive degloving of the distal thumb, with most of the distal phalanx missing (see trauma room pictures). Clinical and radiographic examination revealed that almost 1/2 of the total depth of the carpus was missing (including articular cartilage) and that there was massive bone loss from the distal ulna. Finally, there was a large amount of soft tissue loss.

Therefore, the second stage procedure

consisted of:

Repeat Irrigation and debridement

What would the postoperative plan be ?

Postoperatively, the arm was placed in a full-length splint. Perfusion to the free flap was monitored for one week using continuous Laser Doppler Flow (LDF) readings. The hand and elbow were immobilized for four weeks at which time sutures and the proximal radioulnar pin was removed. The wrist remained splinted but active ROM was begun at the MCP, PIP and DIP joints of the fingers and at the elbow.

At the six week mark the pin across the MP joint of the thumb was removed, and a removable thermoplastic splint was applied. Aggressive physiotherapy of the elbow (flexion / extension / pronation / supination) was begun, as was active and passive ROM of the fingers.

Two months postoperatively, the patient was doing well, had regained -15 to 90 degrees of flexion at the MCP joints of her fingers, full ROM of the PIP/DIP joints, and could pro/supinate 60 degrees each direction.

The free flap remained viable and this young woman is scheduled for debulking of the free flap approiximately six months from her last surgery.