

Case 1

Thumb amputation

A 67-year-old right hand-dominant man sustained a table saw injury to his right hand



Objective 1: The candidate can appropriately triage this patient.

Question 1: You are called by a peripheral hospital 1 h from your trauma centre. The emergency physician explains that he has a 67-year-old right hand dominant man who sustained a table saw injury to his right hand. He has amputated part of his thumb. The patient's wife brought the amputated piece with them to the hospital. What pertinent information do you want to know from the emergency physician?

Key Answers 1:

Time since injury occurred

Level of injury

Extent of injury to remainder of hand

Status of amputated tip (crushed, mangled, contaminated versus cleanly lacerated)

Extent of bony injury (associated fractures, bone defect, multilevel injury)

Smoking history

Medical comorbidities

Objective 2: The candidate is aware of the indications and contraindications for replantation.

Question 2: The referring physician informs you that the patient is otherwise healthy and is a non-smoker. The accident happened approximately 90 minutes ago. There are lacerations to the index and long fingers. The thumb is obliquely lacerated just distal to the interphalangeal joint. He is not sure if the distal portion is good enough to replant. How will you instruct this physician?

Key Answers 2:

Send patient immediately to trauma centre

Keep patient NPO

Instructions regarding the amputated part (digit wrapped in moist gauze, wrapped in plastic bag, placed on ice, avoid touching finger to ice directly)

Objective 3: The candidate can develop a management plan

Question 3: The patient arrives from the peripheral hospital. Examination of the amputated tip reveals multi-level trauma, segmental bone loss, and absence of recipient vessels (see additional photo). The thumb has dorsal oblique amputation just distal to the IP joint with obvious exposed bone. X-ray of the remainder of the hand shows no fractures. What are your options for closure of this wound?

Key Answers 3:

First dorsal metacarpal artery flap

Groin flap

Inframammary flap

Bone debridement and grafting (less desirable option to preserve length)

Revision amputation (not indicated because involves significantly shortening thumb)

Additional photo



Case 2

Shoulder gunshot wound

An otherwise healthy 18-year-old man sustained a self-inflicted gunshot wound to the left chest and shoulder.



Objective 1: The candidate can appropriately examine the patient.

Question 1: An otherwise healthy 18-year-old male sustained a self-inflicted gunshot wound to the left chest and shoulder. The trauma team has stabilized him and this is his only injury. There are no cardiac or pulmonary concerns. Describe your physical examination of this patient related to his injury.

Key Answers 1:

Examination of the wound:

- Size of defect
- Exposed structures (vessels, nerves, bone, muscle)
- Features of the wound (cleanliness, foreign body, etc)

Examination of the extremity:

- Vascular examination of the hand
- Palpable pulses
- Allen's test
- Sensory examination of the upper extremity
 - Dermatomal examination (C5-T1)
 - Peripheral nerve examination (radial, median, ulnar)
- Motor examination of the upper extremity – focused
 - brachial plexus examination
 - Axillary nerve
 - Suprascapular nerve
 - Musculocutaneous nerve
 - Radial nerve
 - Median nerve
 - Ulnar nerve
- Shoulder joint examination

Examination for potential donor sites for closure

Objective 2: The candidate can formulate a management plan.

Question 2: Following examination, the summary of injuries includes a 14 cm × 9 cm soft tissue defect, Gustilo 3B open fracture with a four-part proximal humerus fracture, acromion fracture, coracoid fracture and a brachial plexopathy (see additional photo). What is your management plan for this patient?

Key Answers 2:

- Serial irrigation and debridement
- Allow demarcation of devitalized tissue
- Consultation orthopedics for bony/ligamentous shoulder repair
- Soft tissue coverage of defect when applicable
- Dressing management until definitive closure

Objective 3: The candidate demonstrates an understanding of options for soft tissue coverage.

Question 3: After several serial irrigation and debridements, the patient undergoes definitive repair of his rotator cuff and ORIF of his left humerus by orthopedics. He is left with a 14x9 cm soft tissue defect. What are your options to close this wound?

Key Answers 3:

- Pedicled latissimus dorsi flap
- Pedicled thoracodorsal artery perforator flap
- Pedicled parascapular flap
- Pedicled scapular flap
- Tissue expansion and advancement flap

Objective 4: The candidate demonstrates ability to perform a pedicled latissimus dorsi flap

Question 4: You decide to proceed with a pedicled latissimus dorsi flap for soft tissue coverage. Describe your pre-op markings and your surgical technique.

Key Answers 4:

Markings:

- Template of the defect
- Boundaries of latissimus muscle – superior edge at inferior angle of scapula

Position template to create skin paddled centred over centre of latissimus dorsi muscle with a pivot point approximately 8 cm from the posterior axillary fold

Elliptical skin paddle designed to incorporate template and oriented in manner that enables closure of skin.

Operative Technique:

- Incise around the designed skin paddle and dissect down to latissimus dorsi fascia
- Elevate a subcutaneous plane superiorly and inferiorly to expose the latissimus dorsi muscle
- Create a subcutaneous tunnel to the defect
- Expose the lateral border of the latissimus dorsi muscle and elevate from lateral to medial dividing inferiorly through the muscle with cautery
- Elevate from distal to proximal
- Thoracodorsal vessel will enter the deep surface of the muscle approximately 8 cm from the posterior axillary fold
- Identify the inferior border of the serratus anterior muscle and elevate the latissimus dorsi muscle superficial to it, leaving serratus attached to chest wall
- Clip and divide the branch to serratus
- Pass the latissimus dorsi myocutaneous flap through the subcutaneous tunnel into the defect
- Inset the flap with layered closure over a drain
- Close the donor site in layered closure over a drain

Additional photo

