Case 1

Partial mastectomy defect

A 43-year-old woman presents for discussion of breast reconstruction

Objective 1: The candidate can obtain an appropriate history of a partial mastectomy defect.

Question 1: What information would you obtain on history?

Key Answers 1:

Patient factors:

- allergies/medications
- comorbidities (diabetes, smoking, previous surgeries etc)
- height, weight, BMI, current bra size
- goals – breast size, concerns

Breast factors:

- features of cancer diagnosis – type, stage, time of diagnosis, prognosis, current status
- details of cancer treatment – prior surgeries, adjuvant therapy (chemo, radiation)

Objective 2: The candidate can perform an appropriate physical examination

Question 2: What would be involved in your focused physical examination of this patient?

Key Answers 2:

Assessment of skin envelope (thickness, colour change, radiation damage, scars on breast)

Palpation of breast (rule out masses, assess for tethering to underlying chest wall)

Breast measurements (SN to N, N to IMF, breast width, breast height, ptosis)

Examination of underlying chest wall

Examination for potential donor sites

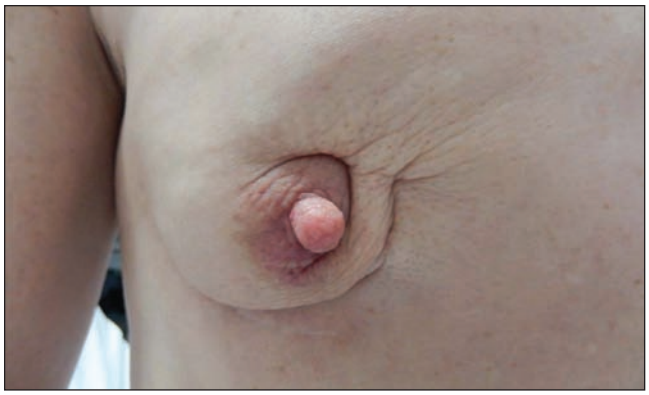
Examination of the axilla for lymphadenopathy

Objective 3: The candidate can develop a management plan

Question 3: The patient informs you that she was diagnosed three years ago with a T1N0 invasive ductal carcinoma. This was resected with clear margins and a tissue expander was placed at the time of her resection. She completed a course of radiation therapy but did not require chemotherapy. Following exchange to permanent implant, she unfortunately developed infection and implant exposure necessitating removal. She dislikes the asymmetry of her breasts. She has always wanted to be larger than her current size. It has been over a year since her last surgery. She is an otherwise healthy non-smoker.

Additional photo

She has both periareolar and inframammary scars.



What are your options for management of this patient?

Key Answers 3:

Implant-based:

- insertion tissue expander +/− acellular dermal matrix

Autologous:

- latissimus dorsi alone
- latissimus dorsi plus implant
- latissimus dorsi plus tissue expander
- pedicled TRAM
- free abdominal flap (TRAM, MS-TRAM, DIEP)
- free tissue transfer (SGAP, IGAP, TUG)

Contralateral breast:

- balancing augmentation

Question 4: The patient decides to proceed with a two-stage reconstruction. At the first stage, you plan to do a hemi-latissimus dorsi flap and insert a tissue expander. At the second stage, you plan to exchange the expander for a permanent implant and do a balancing augmentation.

What complications will you discuss with the patient when obtaining consent for the first surgery?

Key Answer 4:

General complications:

- anaesthetic
- bleeding, infection, scarring, wound healing
- asymmetry

Flap complications:

- donor site morbidity (seroma, hematoma, scarring, pain, alteration of function)
- flap viability (partial necrosis, flap loss)
- flap inset (patch appearance)

Implant complications:

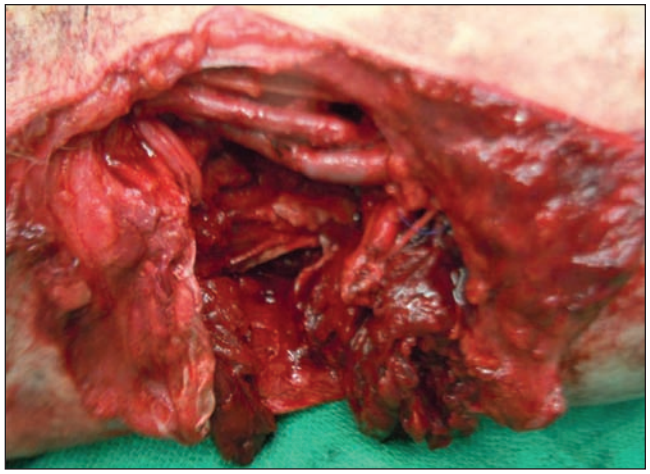
- exposure, extrusion, infection, malposition, capsular contracture, rupture, discomfort

Correspondence: Dr Kirsty U Boyd, Dr Daniel A Peters, University of Ottawa, Box 213, 1053 Carling Avenue, Ottawa, Ontario K1Y 4E9. E-mail kuboyd@gmail.com

Case 2

Axillary degloving injury

A 36-year-old left hand dominant dairy farmer presents to the emergency department via ambulance after getting his left arm caught in a grain auger. He sustains a significant injury to his left axilla, including arterial injury. You are called into the operating room by the vascular surgery service after they have performed an axillary artery repair with vein graft.



Objective 1: The candidate demonstrates knowledge of the anatomy of the axilla

Question 1: What structures are you concerned about when inspecting this wound?

Key Answers 1:
Soft tissue deficit
Vascular structures (axillary artery and vein)
Neurologic structures (branches of brachial plexus – median, radial, ulnar, musculocutaneous, axillary nerves)
Muscular structures (brachialis, biceps brachii, coracobrachialis, triceps brachii)
Bony structures (humerus, shoulder joint)

Objective 2: The candidate can form an appropriate management plan

Question 2: What would be your operative approach to this patient at this time?

Key Answers 2:
Debridement of devitalized tissue
Identification of injured structures
- use of anatomical knowledge to identify nerves
- use of hand-held nerve stimulator (ensure no paralytics from anaesthesia)

Assessment of tissue deficit
- take arm through full range of motion
- identify nerve gaps, muscle deficit, soft tissue deficit

Primary repair of structures where feasible
Obtain soft tissue coverage of vital structures
Plan for return to OR at later date for repair of structures as needed

Questions 3: The patient has lacerated axillary artery and vein (both repaired by vascular), median, radial, ulnar nerves, and triceps muscles. The musculocutaneous and axillary nerves are intact, and stimulate, as are the elbow flexors. You have identified the proximal and distal ends of the nerves, however there is at least a 2 cm nerve gap when the elbow is flexed.
How will you proceed at this point?

Key Answers 3:
Recognize that primary repair of injured nerves is inadvisable given nerve gap
Plan to tag the distal and proximal nerve ends for later nerve grafting
Obtain soft tissue coverage of vital structures with local rotation or advancement flaps where possible
Recognize that you do not have consent and have not examined or met the patient

Question 4: The patient presents four weeks following his initial injury. The arm is viable. Physical examination confirms functionality of the axillary and musculocutaneous nerves. The wound is now healed (see additional photo 1).
What is your operative plan for this patient?

Key Answer 4:
Delayed nerve grafting
Large incision to expose proximal and distal nerve ends
Harvest of donor nerves (likely bilateral sural nerves, potentially MABC as will need multiple cables)
Resection of scarred nerve ends back to healthy fascicles
Cable grafts
Epineurial repair under microscope

Objective 3: The candidate has an understanding of the prognosis of a high-level nerve injury

Question 5: What will you tell the patient regarding his prognosis for regaining function of this arm?

Key Answer 5:
High level injury
Dominant arm
Multiple nerves damaged
Will require extensive physiotherapy
Likely good recovery of proximal musculature (radial nerve best)
Likely reasonable recovery of wrist and extrinsic hand function
Likely poor recovery of intrinsic muscle function of the hand given distance to motor end-plates

Additional photo 1