Rapid methods of testing and teaching basic knowledge and skills on hand injuries and soft tissue trauma

Objective
It is important to be aware of a junior doctor’s potential limitations and knowledge regarding hand injuries and relevant anatomy to ensure no injuries are missed.

We developed rapid and easy methods to form a general idea about a new junior doctor’s knowledge about hand anatomy, hand trauma and initial management and identify potential pitfalls and learning needs.

Methods
Over a 9 month period, junior staff performing a rotation at our plastic surgery department were asked to complete a short questionnaire on three commonly presenting plastic surgery trauma scenarios: 1. laceration on the hand; 2. hand fracture; 3. pretilial leg injury.

Each case was presented using a printed photo or X-ray followed by questions to elicit descriptions of taking a relevant medical history and performing a clinical examination as well as forming a management plan.

Candidates were asked to provide written answers individually without the use of any books or internet resource. No time limit was given.

On returning their questionnaires, all candidates were provided with a short individual session to discuss their answers.

This was followed by another interactive session to test hand anatomy knowledge and practical skills. The candidates were asked to put on an examination glove from the ward and draw the nerve innervations areas and tendon zones on it.

Results
8 people completed the questionnaires. Two 5th-year medical students, two locum doctors and four trainees. None had previous plastic surgery experience. However, the trainees ranged from no previous surgical experience to two years basic surgical training. Although some incomplete answers were given, no questions were answered correctly.

The medical students and two most experienced trainees gave the most extensive answers. However, the latter provided answers with a more relevant clinical approach and gave a more thorough management plan. They were also fastest in returning their questionnaires.

The examination glove was found to be readily available and versatile to test and teach hand anatomy and skills. As well as anatomical landmarks, trainees could advance their knowledge on local flaps, incision lines for wound explorations and carpal tunnel release. Moreover, they could keep the glove to remind oneself of the teaching.

Informal feedback, in particular from the locum doctors and medical students, was good as it provided an opportunity to refresh and consolidate their knowledge and skills required for working in the department.

Example answers by medical students.

Example answers by most experienced trainees.

Cases
35 year old man referred by emergency department with a glass cut on left hand

What questions do you want to ask in the history?
- Mechanism of injury? Amount of blood loss? Loss of sensation?
- Hand dominance?
- Position of hand during injury? Where/clean or dirty glass?
- What other questions do you want to ask?
- Medication, allergies: tetanus, diabetes?
- Past medical history, drug history, time last eaten, occupation, tetanus status, allergies?

Describe the injury?
- 2cm longitudinal wound over dorsum left hand base of middle finger, mild surrounding swelling, minimal bleeding, clean -2.3cm laceration dorsum left hand extensor zone 5 over 3rd MCP towards radial side

Describe how you would perform the examination of this patient’s hand?
- Position of fingers held in flexion? Movement-able to flex, extend, abduction, adduction fingers, capillary refill time, sensation ulnar & radial digit, gross sensation-median, ulnar and radial nerve.
- 1. assess wound under local anaesthetic- depth, visible structures 2.assess tendon function of fingers, 3. Assess distal neurovascular status. 4. Assess for any other injuries and X-ray to look for foreign bodies or bony injury

What structures in particular could be damaged?
- Extensor tendons, branches of radial nerve
- Extensor (EDC/EIP) tendons, open 3rd MCP

What is the management plan?
- Elevate, antibiotics, wash wound, dressing, X-ray, remove large foreign bodies
- Analgesia, nerve block?, X-ray, washout, wound closure, follow up in dressing clinic.
- Clean and dress wound, primary closure if appropriate, oral antibiotics, wound advice, elevation, follow up depending on injury, i.e. trauma operating list if tendon injury or dressing clinic if intact
- Exclude fight bite. Local anaesthesia, irrigation, if underlying structures intact (check in flexion too) can be closed 5-0 nylon, if damaged for exploration and repair in theatre.

82 year old woman, fell at home referred by A&E with a large bruise on her left leg
- What questions do you want to ask in the history?
- What other questions do you want to ask?
- Describe the injury.
- Describe how you would perform the examination of this patient’s leg.
- What structures in particular could be/is damaged?
- What is the management plan?

Conclusion
Using a short questionnaire and readily available examination glove can rapidly and inexpensively assess a new junior doctor’s basic knowledge and skills on hand trauma and identify potential learning needs to be addressed during their rotation.