Hand solutions: an approach to hand injuries in primary care
STEVEN MILLER, MD, FACS
General, Trauma and Hand Surgeon, Maricopa County Integrated Health System, Phoenix, Arizona, USA

Correspondence to: Steven Miller (kayakmd@cox.net)

Hand solutions for the primary care physician, particularly in rural Africa, are predicated upon prompt and skilful diagnostic acumen. Evaluating the hand is no different to examining any other organ system. However, it is perceived as both an essential part of human independence and cosmetics. The hand serves as one of our finest tools and sensory receivers. Returning your patient to independence and occupation is a noble art and hand care is critical to that purpose.

Treating a patient who has suffered a hand injury begins with an accurate history – not a simple task with language barrier and anxiety factored into the problem. Hand dominance, work history, medical history and especially details of the injury or complaint should be identified.

Physical examination starts with the neurovascular exam. Is there a good pulse: radial and ulnar? Is the Allen’s test delayed by more than 10 seconds? Is there a delayed capillary refill at the finger tip? Is two-point discrimination at the finger pulp intact? (2 - 5 mm is normal). The mechanism of trauma such as crush or laceration could explain the ischaemic hand. Documenting soft-tissue loss, degree of burn or need for skin graft is helpful.

Fractures are sometimes subtle, but can be identified with a good history and by carefully examining the suspicious area on X-ray (Fig.1). A three view X-ray is necessary. However, if X-ray is not available then palpation and inspection, observing open fractures or feeling crepitus can aid in the diagnosis. An open fracture is best treated promptly with intravenous antibiotics and then sterile irrigation. Further repair would depend on available surgical care.

The shotgun blast in Fig. 2 resulted in catastrophic tissue loss. As noted, the index
finger could not be salvaged but using available skin and soft tissue, a flap was mobilised to afford a functional hand despite the extensive injury (Fig. 3).

Wrist injuries are particularly troublesome as they can result in subtle fractures with disability. A scaphoid fracture (Fig. 4), the most common carpal bone fracture, can result in proximal bone non-healing because most (80%) of the blood supply is from a single vessel that begins distal to the proximal bone. It is likely this small twisted peanut-shaped bone is fractured at its 'waist' and will cause a non-union or even avascular necrosis. The scaphoid supports the trapezium outside the plane of the palm, which supports the first metacarpal. The thumb is thereby enabled to oppose all other digits outside the plane of the palm. Encourage your patient to stop using any form of tobacco, and keep them in a thumb spica cast a minimum of 6 weeks followed by 6 weeks of range of motion with a splint. The scaphoid can be repaired but most healthy patients will heal this injury without surgical intervention providing it is aligned and promptly immobilised.

The most common wrist fracture, the distal radius fracture, is fortunately likely to heal well with good care. Reducing the fracture, providing it is not severely malaligned with intra-articular fragments, should be straightforward after placing the hand in finger traps and infiltration of the fracture line haematoma with 1% lidocaine without adrenaline. A 'sugar tong' splint will keep the wrist stable and accommodate swelling until a short arm cast can be applied 7 - 10 days later. If the fracture is non-reducible and especially if the neurovascular status of the hand is questionable this patient needs prompt orthopaedic and hand surgical evaluation.

Finger trauma is expected in a primary care situation. An effective finger block with xylocaine without adrenaline injected at the radial then ulnar side (not circumferential) will help resolve the patient's pain problems while you can treat the finger. A glove tourniquet may be necessary to permit a dry field for examination. Finger-tip amputations distal to the distal interphalangeal (DIP) joint can be simply debrided and coated with antibiotics in a child. They will grow a new finger-tip – honestly! In adults, however, debridement and closure is best after approximately age 16. Severe tissue loss in critical finger pulps can be resolved with either a thenar or cross-finger flap.

Foreign bodies, splinters and glass, can be vexing. Take your time. Use good lighting and magnification. Advise your patient that you may not be successful. Go with the money: where does the patient feel the most pain? X-rays are seldom helpful, unless the foreign body is metal.

Although I do not advise a full Brunner incision for exposure of a finger in a primary care situation, this is a technique with tourniquet and anaesthesia that affords excellent exposure for tendon repair, foreign-body removal and abscess drainage. If no other surgical care is available nearby then consider talking over your intended procedure with an experienced colleague before proceeding (Fig. 5).

In the western USA rattlesnake bites are not uncommon. Like every venomous bite, especially in Africa, patients are first treated with antivenom then, as the patient systemically improves, attention is directed to the affected tissue. In over 85% of rattlesnake bites in the USA the upper extremity is injured. Debridement of necrotic tissue as shown in the thumb debridement in Fig. 6 a week after the bite is necessary, followed by tissue coverage.

Paronychia and felons are likewise surgical problems easily solved in a primary care office with a finger block, glove tourniquet and strict attention to delicate surgery. The felon should never be drained with the 'fish mouth' incision. I prefer a small longitudinal incision over the pulp finger abscess followed by drainage, irrigation and daily soaks. Dakins solution (dilute bleach: approximately 28 g bleach to 28 g sterilised water or normal saline) is an excellent irrigant and soaking solution for fingers. Fig. 7 shows paronychia drainage with the scalpel blade always parallel to the nail.
Hansen’s disease is considered rare except in sub-Saharan Africa and India. The hallmark ulnar anesthetic fingers and absorbed finger tips can progress to absent intrinsic muscles of the hand (interosseus and lumbricals), resulting in a ‘claw hand’.

Transferring functional tendons (i.e. flexor digitorum superficialis) can reconstruct the co-ordinated grasp lost with the absent intrinsic muscles. The patient can become independent, even functional again, despite neurological defect. Your patient with longstanding ulnar or median nerve trauma may need similar transfers due to muscle wasting. Step one is recognising the deficit and then enabling your patient with a solution: an available experienced surgeon to do the transfers.

Hand solutions are essential in rural care medicine. Hand solutions can assist you in returning your patient to a healthy independent life.

**Fig. 6. Rattlesnake debridement.**

**Fig. 7. Paronychia.**

Having a larger waistline may shrink your brain.

Obesity is linked to an increased risk of type 2 diabetes, which is known to be associated with cognitive impairment. So Antonio Convit at the New York University School of Medicine wanted to see what impact obesity had on the physical structure of the brain. He used magnetic resonance imaging to compare the brains of 44 obese individuals with those of 19 lean people of similar age and background.

He found that obese individuals had more water in the amygdala – involved in eating behaviour. He also saw smaller orbitofrontal cortices in obese individuals, important for impulse control, and also involved in feeding behaviour. ‘It could mean that there are less neurons or that those neurons are shrunken,’ says Convit.

Eric Stice at Oregon Research Institute, Eugene, thinks that the findings strengthen the ‘slippery slope’ theory of obesity. ‘If you overeat, it appears to result in neural changes that increase the risk for future overeating,’ he says. Obesity is associated with a constant, low-level inflammation, which Convit thinks explains the change in brain size.

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