A 74 year old previously healthy man presented to the emergency department with acute onset of pain and swelling in the right hand. Earlier that evening he had played a game of recreational ice hockey. He did not have a fever and was otherwise well. He had not experienced trauma during the game and his medical history was unremarkable. Physical examination showed large lesions on the right hand (figs 1 and 2).

Questions
1 What do the images show?
2 What is the diagnosis and what differential diagnoses should be considered?
3 What are the most likely organisms responsible for the condition?
4 What is the appropriate management?

Answers
1 What do the images show?

Short answer
Figure 1 shows large tense bullae with surrounding erythema sparing the index finger. The blisters extend proximally to the metacarpophalangeal joints and affect the volar and dorsal aspects of the fingers (figs 1 and 2).

Long answer
It is important that the skin lesions and their distribution are correctly identified to establish a working differential diagnosis in this case. Well circumscribed, raised, and fluid filled lesions can be classified as vesicles or bullae, depending on size. Vesicles are defined as being less than 0.5 cm, whereas bullae are larger than 0.5 cm.1 The pathophysiology of blistering of the skin is varied, and causes can be autoimmune, frictional, infectious, and even genetic.

2 What is the diagnosis and what differential diagnoses should be considered?

Short answer
This is an example of blistering distal dactylitis—a superficial bacterial infection of the anterior fat pad of the distal phalanx that presents with large blisters.2 3 The differential diagnosis includes cellulitis, bullous impetigo, bullous pemphigoid,
herpetic whitlow, herpes zoster, coma blister, thermal injury, allergic contact dermatitis, and fixed drug eruption.

**Long answer**

The lesions of blistering distal dactylitis can be confused with traumatic causes or other infections that present with bullae. Blistering distal dactylitis presents with tense bullae affecting the anterior fat pad of multiple fingers, although extension beyond this area does not preclude the diagnosis.

The index finger and thumb are most commonly affected, with multiple bullae, 10-30 mm in diameter.3 Toes can also be affected, although this is less common. Patients are usually 2-16 years of age, but adult cases are not rare. Diagnosis is confirmed with a Gram stain of blister fluid.

Blistering distal dactylitis can share features with other bacterial skin infections, including cellulitis and bullous impetigo, but remains distinguishable clinically. Cellulitis is characterised by an erythematous, expanding, and painful plaque. The bullae were the most prominent finding in our case—erythema was much less pronounced. Bullous impetigo is also characterised by bullae, which are more superficial, often associated with golden crusting, and not localised to the digits. Herpetic whitlow and herpes zoster are both viral infections that can present with blisters; however, the characteristic morphology of a “dew drop on a rose petal” would be expected. This describes a small vesicle on a prominently erythematous base. Crucially, groups of many smaller vesicles that coalesce into the bullae seen in herpetic infections are absent in our case. Coma blisters, which appear at sites of maximal pressure, and thermal injury can both present with bullae. However, our patient had no history of trauma, burns, or chemical exposure.

The patient had played hockey earlier that day. Tightening of skate laces can cause superficial injury to the hands and predispose to superficial skin infections. In addition, moist infrequently washed hockey equipment can be a breeding ground for infectious organisms. In this case, we hypothesise that the point of entry for the infection was microtrauma sustained while the skates were put on and the laces tightened. There is an abundant literature on cutaneous infections in sports,4-6 but we found no cases that connected blistering distal dactylitis with sport, despite an exhaustive search. We did identify articles in the lay press that had some relevance, however.7-9

**3 What are the most likely organisms responsible for the condition?**

**Short answer**

Classically, the condition is caused by group A β haemolytic streptococci (Streptococcus pyogenes), with some reported cases caused by Staphylococcus aureus or Staphylococcus epidermidis.8-13

**Long answer**

The main causal organisms for blistering distal dactylitis are Gram positive bacteria, including S pyogenes (group A β haemolytic streptococcus), S aureus, and S epidermidis.8-12 Blister cultures obtained after cleaning the skin to minimise contamination grew two organisms—S pyogenes and Streptococcus mitis. S mitis is an α haemolytic streptococcus and is atypical for blistering distal dactylitis. It is difficult to determine whether this second isolate played a role in the patient’s presentation.

Other infectious agents, including meticillin resistant S aureus (MRSA) and coinfection with herpes simplex virus, have been linked to blistering distal dactylitis.13-14 For this reason, we looked for herpes simplex virus using the polymerase chain reaction, but the result was negative. All viral and fungal cultures were negative.

**4 What is the appropriate management?**

**Short answer**

The treatment recommended for blistering distal dactylitis consists of incision and drainage of the blisters, followed by a course of antibiotics, usually of 10-14 days’ duration.3-9

**Long answer**

Most bacterial skin infections, including blistering distal dactylitis, are caused by β haemolytic streptococci or S aureus. Uncomplicated staphylococcal infections generally respond well to cephalosporins, which are structurally related to penicillins and disrupt the synthesis of bacterial cell walls. The four generations of cephalosporins have unique spectrums of antimicrobial properties. Cephalexin is a first generation cephalosporin that covers Gram positive bacteria, such as streptococcus and staphylococcus, but is not active against MRSA. Thus it is an excellent choice in the treatment of most cases of blistering distal dactylitis.

**Patient outcome**

The patient improved with a 10 day course of oral cephalexin, debridement of blisters via a lateral puncture, and silver sulfadiazine dressings.

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