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## Correspondence

### Limb presentations of invasive Group A Streptococci infection in children <sup>☆</sup>

Dear Sir,

#### Introduction

Group A streptococcal (GAS) infections were brought to public attention in the United Kingdom in 2022 with widespread media attention.<sup>1</sup> We present a series of cases that required combined surgical management from Plastic and Orthopaedic surgery. The aim of this paper is to highlight limb related presentations associated with invasive GAS in children and important lessons learnt.

#### Background

Group A streptococcus (*Streptococcus Pyogenes*) is a Gram-positive Cocci which is a common pathogen in humans causing pharyngitis or tonsillitis, but also causes soft tissue infections.<sup>2</sup> However, in rare cases it can become invasive, leading to systemic bacteremia and life-threatening sepsis.<sup>3</sup> Invasive GAS is associated with skin and bone infections including cellulitis, septic arthritis, myositis, and necrotising fasciitis.<sup>4</sup>

#### Case presentations

##### Case 1

A 19-month-old girl presented with 3 days of pyrexia, right arm swelling and blanching rash. She had no recent trauma or varicella infection but had evidence of pharyngitis. The patient deteriorated with profound arm swelling and sepsis. She was taken to theatre and were pus within the elbow which was washed out and tight compartments which required forearm and upper arm fasciotomies (Figure 1). Blood and tissue cultures showed GAS. On table echocardiogram did not show evidence of endocarditis.

A total of 5 washouts were required before delayed primary closure of the forearm. She was initially treated with intravenous Ceftriaxone and Clindamycin for two weeks followed by 4 weeks of oral amoxicillin as per microbiology advice. She recovered well and has fully healed wounds, with no limitations of arm or hand function.

##### Case 2

An 18-month-old girl presented unwell with erythema and swelling of the left chest wall and wrist. She had a preceding coryzal illness but no history of varicella infection or trauma. An ultrasound

<sup>☆</sup> Aspects of this work were presented at British Society of Surgery of the Hand (BSSH) Swansea 2023



**Figure 1.** Images showing right upper limb fasciotomy.

scan showed subcutaneous inflammation of the chest wall. The child was taken to theatre and pus was found in the chest wall coming from the sternoclavicular joint. There was also pus tracking along the left wrist extensor retinaculum. Due to the minimal findings on ultrasound, clinical correlation was key. Blood culture and throat swap showed GAS.

On table echocardiogram did not show evidence of endocarditis. A total of 3 washouts were required and debridement of the sternal head of the clavicle prior to closure. The child was initially managed with clindamycin and ceftriaxone before being converted to oral amoxicillin.

10 days post discharge she was reviewed with exudate from the clavicular wound. An MRI scan showed oedema of the clavicle with potential osteomyelitis. Surgical exploration found subcutaneous turbid fluid but there was no pus in clavicle canal. After wound washout she was managed with 4 weeks of oral amoxicillin and recovered with no further surgical intervention.

### Case 3

A 4-year-old boy with no past medical history presented generally unwell with a swollen right arm and widespread varicella zoster infection. After clinical deterioration and spreading erythema of the right arm he was taken to theatre for debridement, which showed necrotising fasciitis. This was confirmed to be Group A streptococcus via culture and fascial histology. He was managed initially with Clindamycin and Ceftriaxone changed to linezolid and gentamicin on microbiology advice.

After 5 washouts and change of dressings, cultures returned no bacterial growth. The surface loss on his right arm was 3.5% TBSA and was reconstructed with split skin grafting. He recovered well with full function of the arm but some hypertrophic scarring.

### Discussion

As seen in these cases Invasive Group A streptococcal (iGAS) infections can present in multiple ways in limbs. As such, decision making can be challenging, and multiple consultant opinion is helpful. As highlighted in case 2, skip lesions can occur which can make diagnosis difficult. In many of these cases it can be considered as a form of malignant sepsis seeding to avascular structures.

Imaging can be helpful but clinical correlation is key, in the face of overwhelming sepsis and foci of infection then surgical exploration should occur. We advocate exploration of any areas which are tender, swollen and erythematous, with early surgical treatment needed if collections are present. The limb swelling can be severe and cause compartment syndrome requiring fasciotomies. On table echocardiography is useful to exclude endocarditis in children as this allows for better quality images and helps to stratify antibiotic duration.

Necrotising fasciitis in children is rare but has a different microbiome to adults. Monomicrobial infection is more common than polymicrobial, with GAS the most common causative bacteria.<sup>5</sup> As such it should always been considered in children with sepsis with cutaneous lesions and known GAS.

### Key learning points

- Invasive Group A streptococcal infections can present in multiple ways in limbs
- Skip lesions can occur with multiple foci of infection
- Decision making can be challenging, and early multiple consultant opinion is helpful
- Early and aggressive surgical treatment needed if collections are present
- On table echocardiography is useful to exclude endocarditis in children

### Ethical approval

Not required.

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## Declaration of competing interest

None.

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