

Original Research Article

Diagnosis and management of neglected foreign body foot in children

Reyaz Ahmad Wani¹, Kumar Abdul Rashid^{1*}, Muneer Abas Malik²

¹Department of Pediatric Surgery, Government Medical College, Srinagar, Jammu and Kashmir, India

²Advanced Pediatric Centre, PGIMER, Chandigarh, India

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*Correspondence:

Dr. Kumar Abdul Rashid,

E-mail: drasheeb@gmail.com

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ABSTRACT

Background: Foreign body related extremity trauma is uncommon in children and mostly involves lower limb. Such cases are prone to get neglected or missed and present at a later date with complications. Careful management at the outset can avoid such complications. Clinical suspicion followed by diagnostic imaging and retrieval of foreign bodies in cases with delayed presentation is vital.

Methods: A retrospective case series analysis of foreign body foot, diagnosed and managed over a period of 6 years, was carried out at our institute with the aim to highlight clinical presentation and management of cases with a neglected foreign body foot.

Results: A total of 23 patients with diagnosis of foreign body foot were studied with 15 acute cases and 8 chronic neglected cases. The neglected cases ranged in age from 15 months to 96 months (Mean 58.87 ± 28.32). Male to female ratio was 7:1. The history of trauma was concealed in 6 out of 8 cases. Three presented as abscess, 2 each as cellulitis and non-healing wound and one as a granuloma. Mean delay in foreign body removal was 57.12 ± 67.94 days. Five patients had radiolucent while three had radiopaque foreign bodies.

Conclusions: Clinical suspicion aided by radiography and/or ultrasonography is pivotal in diagnosis. Removal of foreign body can be done by wound exploration under local anaesthesia in most of the cases.

Keywords: Foreign body foot, Cellulitis, Abscess, Ultrasonography

INTRODUCTION

Planter puncture wounds seem to be the most common mode of foreign body related foot trauma.¹ Commonly encountered foreign bodies include needles, vegetative foreign body (thorns, pieces of wood), plastic, glass or ceramic chips. Initial management includes wound irrigation and exploration to retrieve the foreign body. Difficult cases may require radiographic or sonographic localization before removal.²⁻⁴ Foreign bodies, if not removed in time, can incite local tissue inflammation and can lead to complications like cellulitis, abscess formation or non-healing wound.⁵ Sometimes the history of trauma is obscure and foreign body is not detected at the first instance. Retained foreign bodies lead to

complications and increase morbidity and cost of treatment. There is scarce literature available on neglected foreign body foot and its management in pediatric age group. The objective of the study is to present experience of foreign body foot in children with emphasis on diagnosis and management of neglected cases.

METHODS

The study based on a retrospective analysis of all the children of foreign body foot who presented to the department of pediatric surgery, government medical college, Srinagar (India) from February 2015 to January 2021. Institutional Ethics Committee approval and

informed written consent from parents was obtained for analysis and publication of data. Inclusion criteria were: a) the patients aged less than 16 years with foreign body related foot trauma and b) clinically suspected and radiologically proven foreign body foot without history of trauma. Exclusion criteria included: a) cases of foot trauma unrelated to foreign body and b) cases where foreign body was already retrieved as evidenced by imaging. Retained foreign body was defined as one that was not retrieved from foot at first contact with the surgeon after sustaining injury and/or was managed as a non-foreign body related wound. The data sheets of patients were accessed through medical record section of the hospital and following parameters were studied: age, sex, history and duration of symptoms, findings on clinical examination, diagnostic investigations and management. The statistical analysis was carried out using statistical package for social sciences (SPSS Inc., Chicago, IL, version 15.0 for windows). All quantitative variables were estimated using measures of central location (mean and median) and measures of dispersion (standard deviation and standard error).

RESULTS

There were 23 cases with diagnosis of foreign body foot managed during the study period; majority of them being males (M:F=19:4). Patients ranged in age from 15 months to 96 months, with mean age of 58.13 ± 18.60

months. Out of these, 15 were acute cases presenting within hours of injury and 8 were chronic or neglected cases. The diagnosis and management in acute cases was straight forward. All of them underwent irrigation followed by wound exploration under local anesthesia and removal of foreign body. Ultrasound-guided removal was needed in 2 cases where localization of foreign body was difficult.

Demographic and clinical profile of chronic/neglected foreign body foot patients is summarised in Table 1. Seven were males and one female. Three had presented as abscess, 2 each as cellulitis and non-healing wound and one as a foreign body granuloma. The neglected cases presented within 10-180 days after sustaining trauma. Mean delay in foreign body removal was 57.12 ± 67.94 days. Only 2 out of 8 cases, with relatively short history, described manner of trauma. The main sites where foreign bodies had lodged were sole, heel and planter aspect of digits. Five patients had radiolucent while three had radiopaque foreign bodies. Ultrasonography confirmed or suspected a foreign body in all the cases. Wound exploration was done in minor operating room under local lignocaine anesthesia. Fluoroscopic or sonographic guidance was needed in none. After removal of foreign body, wounds were dressed and oral antibiotic course of 5-7 days was given. Complete recovery without any complication was achieved in all the cases.

Table 1: Demographic and clinical profile of patients with chronic (neglected) foreign body foot.

S. no.	Age (months)	Sex	Clinical presentation	Duration (days)	Nature of FB
1	36	F	Non-healing wound	10	Radiopaque
2	15	M	Cellulitis	12	Radiolucent
3	84	M	Abscess	150	Radiolucent
4	36	M	Cellulitis	45	Radiopaque
5	60	M	Foreign body granuloma	25	Radiolucent
6	84	M	Abscess	15	Radiolucent
7	60	M	Abscess	20	Radiopaque
8	96	M	Non-healing wound	180	Radiolucent



Figure 1 (A and B): Radiolucent foreign body (plastic chip from broken toy).

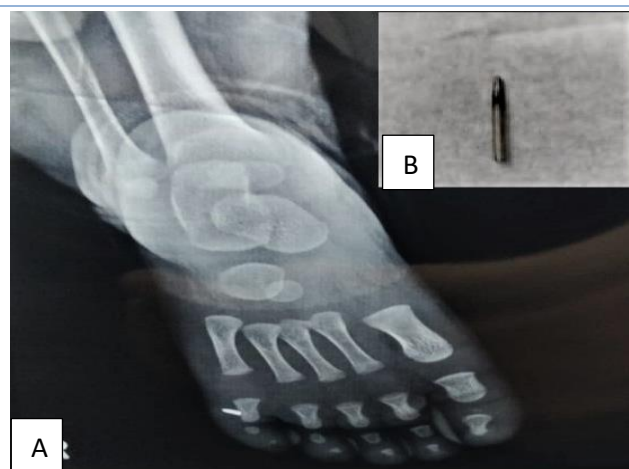


Figure 2: (A) Radiopaque foreign body and (B) broken sewing needle.

DISCUSSION

Foreign bodies in children are mostly limited to head and neck region including aerodigestive tract, eyes, nostrils or ears. To the best of our knowledge, only few case reports of pediatric extremity trauma leading to retained foreign body in foot are described in literature.^{6,9,10} Foreign body related extremity trauma has been classified as acute or chronic depending on the duration of symptoms. In our study, majority of cases were acute with male preponderance (M:F=12:3). Similarly, out of 8 chronic cases, 7 were males. Previous studies have also shown male predominance in extremity trauma.⁶ The reason could be the fact that boys are more commonly involved in outdoor activities than girls. Acute cases, like in our study, are managed in emergency department with wound irrigation and exploration with or without the help of ultrasonography or fluoroscopy. There are instances when foreign body is missed or wrongly labelled as non-foreign body related injury, resulting in delay in the treatment. Such retained foreign bodies invoke tissue response that leads to infective complications like cellulitis, abscess formation or osteomyelitis. This increases morbidity and cost of treatment. Most of the neglected patients in our series initially presented to a peripheral health facility before referral. All of them were managed as non-foreign body related illness. These chronic forgotten foreign bodies are difficult to diagnose because of two reasons: inability of children to recall the exact event of trauma or wrong perception that it had been removed at periphery. Like in other parts of body, retained foreign body in foot can mimic different clinical conditions.^{7,8} One of our patients (S. no. 4, Table 1) was managed as frost bite cellulitis before referral. Another patient (S. no. 5, Table 1) was labelled as corn foot and report to us for second opinion.

In all the cases with neglected foreign bodies, proper diagnosis, after a clinical suspicion, was reached with the help of either a radiograph or an ultrasonogram. Three patients had radiopaque foreign bodies; thus, a simple X-ray clinched the diagnosis. In the rest 5 cases, X-rays did not yield any abnormality. Ultrasound could help localize foreign bodies as echogenic areas with localized collections and/or features of cellulitis in adjacent tissues. The advantage of ultrasound examination in foreign body related trauma is well described in literature.²⁻⁴ Though not needed in the chronic cases, yet ultrasound-guided removal helped in 2 of our acute cases. One of the reasons why image-guided removal was not needed in neglected cases could be that in all of them area of interest was well demarcated due to local tissue response or collection adjacent to foreign body.

Wound exploration and removal of foreign body was carried out in all of our cases under local anesthesia with one child needing some sedation (S. no. 2, Table 1). All the patients were discharged on the same day. None of the patients had recurrence of symptoms or complications.

Our study, being a retrospective analysis based on a smaller cohort of cases, has certain limitations. Firstly, the clinical suspicion in neglected cases makes the study prone to selection bias. Secondly the exact incidence of foreign body foot in children cannot be estimated from this study. It is also not clear from this study what factors predict ultrasound-guided removal of foreign body.

CONCLUSION

Retained or neglected foreign bodies should be suspected in all children presenting with complicated (cellulitis, abscess or non-healing) wounds following foot trauma, especially puncture wounds. X-ray and ultrasonogram not only help to detect the foreign body, but also help in localization. Almost all foreign bodies can be retrieved under local anesthesia.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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