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## **Magnet assisted retrieval of metallic foreign body from ring finger of a child**

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### **Abstract**

Penetrating or piercing injuries are not uncommon in paediatric age with considerable disability if neglected or managed in a suboptimal way. Both metallic and non metallic objects have been associated with various types of penetrating injuries. Many a times certain broken piece of the object is retained and later becomes painful and equally difficult to remove. Very minute pieces or splinters of metallic objects can be successfully retrieved with the help of magnet to assist in the process. We describe our successful experience with the same idea implemented while removing a small splinter of needle from a slender digit of a toddler.

**Keywords:** Pediatric, Foreign body, Musculoskeletal, Injury, Management, exploration

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### **1.Introduction**

Acute Penetrating trauma can be labeled as an elaborate group that is part of human injuries since ages. Both non metallic or metallic foreign bodies cause immediate and remote damages with treatment depending on the clinical features at the time of its presentations. Late complications of neglected musculoskeletal foreign bodies include bursitis, synovitis and arthritis.[1] Early identification and management is easier and cost effective method to deal with these foreign bodies. A high index of suspicion and clinical acumen is warranted to diagnose the embedded foreign bodies. Metallic foreign bodies usually are visible well on plain radiographs and biplanar view gives the idea of its location to some extent. Ancillary investigations like ultrasonography or magnetic resonance imaging (MRI) are reserved for suspected cases. [2] The confirmation is also necessary in view of medico-legal formalities about retained ones. The meticulous retrieval of the object without jeopardising the vital adjacent anatomy in minimal invasive way is a recipe for good functional outcome and uncomplicated healing.

### **2. Case Report**

A two and half year old child was brought by his mother to us with complaints of pain and tiny

bump over volar aspect of his distal phalynx of left ring finger. She gave history of accidental penetrating injury with sewing machine needle to the index finger of child eight months back. The child placed his left ring finger accidentally under the sewing needle while she was operating the manual sewing machine at home. The child cried and withdrew the hand and the needle broke into two halves. The two pieces were removed by the mother instantaneously as they were laid exposed above the skin. The bleeding and wound were managed by a local practitioner with uncomplicated healing and the child returning to his activities of daily living. He had no complaints till last week saw local pointing pain at the site of original wound with tiny bump felt by the child (Fig.1a).

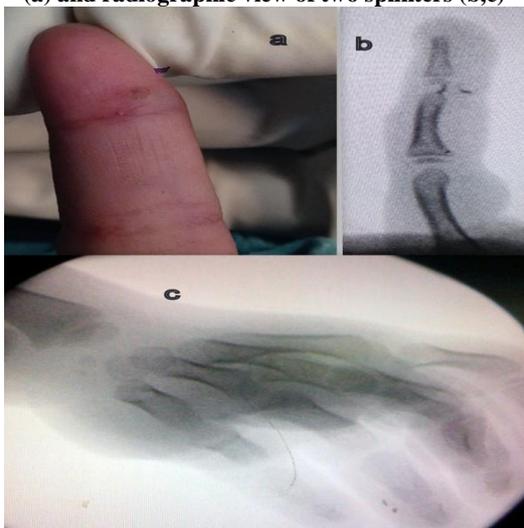
A plain radiograph of the child with clinical suspicion of a retained foreign body was advised to show two minute radio-opaque splinters in the pulp of distal phalynx of index finger (Fig.1 b, c).

There was minimal discomfort and entry site, pain on deep palpation and adjacent joint motion was normal. There was no history suggestive of infection related to the injury. The parents were advised pros and cons of operative retrieval and gave signed informed consent. Small operative field, presence of vital structures and potential disfiguring

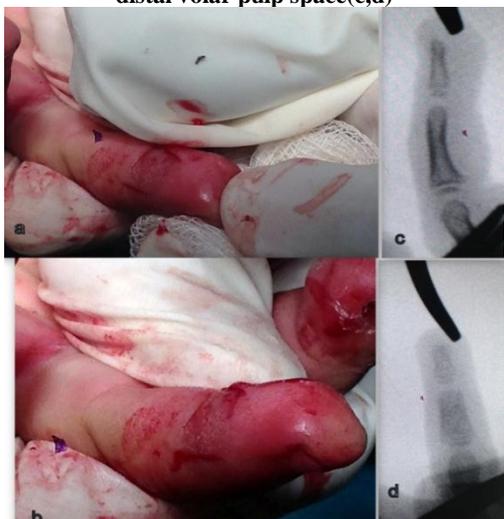
scar called for the operation as minimally invasive as possible. Two small nicks over entry and exit site were made and small artery forceps were manoeuvred to reach the splinters under control of image intensifier. The splinters were tried to push from one side and collected with the help of magnet stack covered in a sterile latex surgical gloves (Fig.2 a,b). A few attempts rendered successful magnet assisted removal of two tiny metal particles and radiographic confirmation of which was noted (Fig. 2 c,d). The splinters and applied technique was shown to parents (Fig.3). A signed consent for future publication was taken from parents in view of minor patient.

The wounds had minimal soft tissue damage with single stitches for each that healed uneventfully. There was no technique related or wound related complication noted in the follow up period. The child was moving his digits after stitch removal on tenth day with no pain and discomfort.

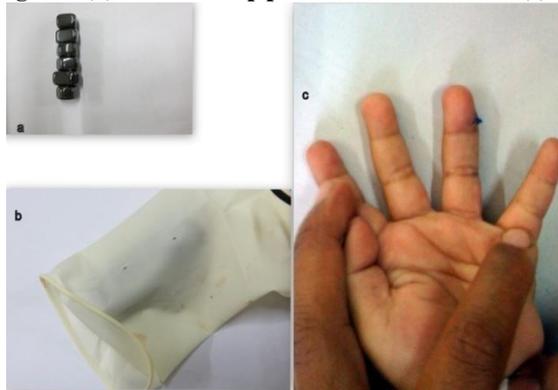
**Figure 1: The entry bump at distal phaynx volar pulp (a) and radiographic view of two splinters (b,c)**



**Figure 2: Intraoperative view of incision and technique with magnet inside gloves at either incision (a,b) and radiographic confirmation of removed splinters from distal volar pulp space(c,d)**



**Figure 3: The stack of magnet (a) inside the surgical gloves (b) and follow up picture of healed wound (c).**



### 3. Discussion

Missed or neglected foreign bodies form a considerable volume of injuries with late complications. 38% of cases in a study were overlooked in first instances in emergency department.[3] A non healing wound or discharging focus, chronic pain and visible lump are common clinical features associated with retained foreign bodies.[4] The clinical symptoms may remain dormant for months or years to present later with localised pain or other pathology. Our case was a child and small size of splinters did little to affect his activities of daily living when after eight months the mother noted pain on local injury site. USG guided removal has been an attractive option but in the hands of expert radiologist.[5] Our institute had limited resources to choose that option. Other issue of concern about the foreign body is migration within tissue planes.[6] Early removal and use of a magnet helped us gain an assistive pull in broader area. The technique also involved lesser soft tissue dissection and prompt healing.

### 4. Conclusion

The simple and innovative use of magnets in certain cases can be instrumental in foreign body removal procedures if used judiciously. Ferromagnetic small splinters can be managed with magnet assisted retrieval and the technique may prove to be successful with minimal complications in selected cases.

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