



## Case Report

# Foreign Body (Bamboo Splinter of Broom Stick) in Soft Tissue

M A Kasem Pramanik<sup>1</sup>, Joydeep Bhaduri<sup>2</sup>, A M Rashid<sup>3</sup>, M Nazmul Hasan<sup>4</sup>

### Abstract

Patients with foreign bodies inside soft tissues are common in a surgeon's daily practice. Radio-opaque foreign bodies can easily be located with radiography but radio-lucent foreign bodies cannot be located with X-ray, where Ultrasonography especially, high resolution ultrasonography can be used to locate it. Ultrasonography, being easily available, cost-effective and radiation-hazard free, can be done repeatedly for foreign bodies which move inside tissues. The presenting article describes a patient with a radio-lucent foreign body, deep inside muscle in his fore-arm and having one sharp end, was advancing inside tissues, was located with the help of Ultrasonography and was removed.

TAJ 2007; 20(1): 67-70

### Introduction

Foreign body inside soft tissues is an object under skin, within muscle or fat which should not be present there normally. It is introduced there usually accidentally or in a foul play or less commonly by a mentally sick person by him/herself. Common foreign bodies are pieces of metal, glass, plant thorn, bamboo-stick, gravel etc. Radio-opaque foreign bodies like metal, gravel, glass etc. can be seen on radiographs but determining the location of radiolucent foreign bodies like wood, thorn, bamboo-sticks etc. deep inside tissues and their removal is a very difficult job for the surgeon. Moreover, foreign bodies having sharp ends, advance inside tissues due to muscular activity and it is not always possible to locate exactly even with the help of detectors before operation and as a result, during operation, a vigorous search inside tissues is made which causes much tissue damage and sometimes ends in failure. CT-scan and MRI are costly, not available

at all centers and sometimes give poor quality information if compared with information gained on ultrasonography. Moreover, X-ray and CT-scans carry risk of radiation and should better be avoided in children and pregnant women. Ultrasonography, especially, high resolution ultrasonography, offer clear picture about the exact location of the foreign body and being less costly, can be done again before operation, if necessary, especially in case of a foreign body having sharp end. This can be very informative for young medical professionals.

### Case history

A 14 year old boy of Baliapukur area of Rajshahi city was brought to a local clinic in the month of September, 2006 with painful swelling on lower half of front of his right forearm following beating by his father, at the height anger, with broom stick. During beating the boy with broom, a bamboo splinter from the broom was introduced inside skin

<sup>1</sup> Associate Professor, Department of Surgery, Islami Bank Medical College, Rajshahi.

<sup>2</sup> Consultant Sonologist, Medipath Diagnostic Centre, Rajshahi.

<sup>3</sup> Junior Consultant, Anaesthesiology, Charghat Thana Health Complex, Charghat, Rajshahi.

<sup>4</sup> Medical officer, Bangladesh Clinic, 358/2, Housing Estate, Uposhahar, Rajshahi.

of front of right forearm of the boy. The outside portion of the stick was drawn out but distal portion of the stick broke and remained inside tissues. The boy was taken to a local doctor who prescribed antibiotics and pain killers but there appeared a painful swelling at the prick site which was increasing in size day by day.

On examination, there was a swelling at the splinter introduction site, on lower part of front of right forearm, of about 1.75 inches x 0.5 inches in size. The swelling was tender, firm, non-fluctuating with very little mobility. There was redness around the site. No pus point was present. Slight limitation of pronation-supination was present at right forearm. Trochlear and axillary lymph nodes were not enlarged.

There was leucocytosis with neutrophilia.

X-ray of the affected part showed no foreign body.

CT- scan of the part could not be provided by the parents for their financial insolvency.

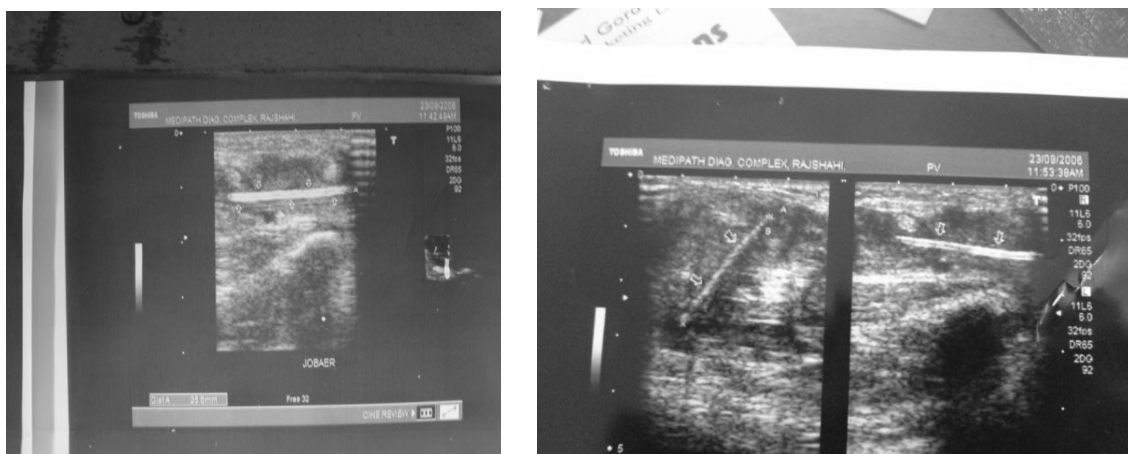
The sonologist examined the patient by conventional ultrasonography and was able to locate the foreign body within a cavity under the skin at the site of the swelling and confirmed it by a high resolution ultrasonography.

Operative removal of the foreign body under general anaesthesia was decided under a broad-spectrum antibiotic cover. After applying Esmarch's tourniquet, an oblique incision was made directly over the swelling. Skin was divided and a cavity was detected in the subcutaneous

tissue. The cavity was incised and very little pus was evacuated from it but no foreign body was detected inside it. During a thorough search by palpating all neighboring tissues between fingers, a foreign body inside a nearby muscle was palpated. The muscle fibers were split longitudinally and the foreign body was removed along with its sharp tip. The cavity in subcutaneous tissue was curetted and suction-drained. The wound was closed primarily after meticulous haemostasis after removal of the tourniquet. The suction drain was removed on 4<sup>th</sup> post-operative day when fluid drainage from the site ceased. The wound healed primarily and the skin sutures were removed on 8<sup>th</sup> post-operative day.



**Fig 1:** X-ray of the part did not show any foreign body



**Fig 2:** Ultrasonography of the part showing foreign body inside a cavity

## Discussion

The standard imaging procedure used in the search for foreign bodies is conventional radiographs, but radiographs alone are not always adequate in the evaluation of foreign bodies.<sup>1,2</sup> Radiographs can identify only radio-opaque substances such as metallic fragments, glass etc. Radio-lucent foreign bodies like wood, bamboo and plant thorns remain undetected most frequently.<sup>3,4</sup> Removal of foreign body, especially radio-lucent foreign body from deep inside tissues, almost always, is a tough job for a surgeon. It is even more difficult in case of radio-lucent foreign bodies with sharp tip which move inside tissues due to muscular activities. Vigorous search inside tissues, sometimes repeatedly by different surgeons or by the same surgeon, results in much tissue damage. So, CT- scan or MRI is needed to detect radio-lucent foreign body along with a swelling. But as these investigations are costly and are not available in all centers in our country, could not be done and a blind or semi-blind approach of removal of such a foreign body is made depending on an assumed or a faint radiological shadow, which usually ends in failure. These are the cases in which ultrasound is the most beneficial modality of investigation. As the foreign bodies are solid substances, so they cause reflection of sound echoes. This makes the fragment hyper-echoic relative to surrounding soft tissue. Thus the identification becomes easy.<sup>5</sup>

MRI can detect foreign bodies but it may be difficult to distinguish low-signal intensity foreign bodies from tendons, scar tissue and calcified area. In comparison, the resolution of this technique is inferior to that of ultrasound.<sup>3,6</sup>

CT-scan has sensitivity 5 to 15 times greater than that of radiography but is less sensitive than ultrasound.<sup>7</sup> Limited availability and high cost further limit the use of CT and MRI. Ultrasound offers far more than conventional radiography in the detection of foreign body. An overall sensitivity of 95% has been cited for detection of foreign bodies using ultrasound<sup>8</sup>. An in vivo study

by Little et al, in 1986 demonstrated wood fragments to be visualized best by ultrasonography, followed in order by glass, plastic and metal.<sup>9</sup>

Another in vivo study by Failla et al, in 1995, has shown sonography to be accurate in the identification and localization of foreign body with diameter as small as 0.5 mm<sup>10</sup>.

But usual frequency of 3.5 MHz used for abdominal ultrasound is not helpful for the search of foreign body in soft tissue. A 5 to 7.5 MHz linear array transducer is recommended for these examinations due to their utility in imaging both superficial and deep seated foreign bodies.<sup>5</sup>

A study by Anderson et al reveals that most common foreign bodies in order of frequency are wood, glass and metal fragments. The study also shows that radiographs correctly identified metallic fragments in 100% of cases but wood was correctly identified in only 15% of cases<sup>1</sup>. So the commonest foreign body remains mostly undetected in conventional radiography. Though no exact study is available in our country, from our own experience, we can say that the incidence of foreign bodies on our country is not uncommon, especially among children in rural areas where people remain bare footed. Foreign bodies like bamboo stick, thorns etc. are very common to be pricked into their foot.

Undetected foreign bodies sometimes create great problem. Patients often forget and cannot always recall the memory of penetration by a foreign body. Some foreign bodies like multiple shotgun pellets do not need removal if not causing any problem. Organic foreign bodies may be infected and may cause local abscess formation which may result in a chronic discharging wound. A foreign body nearby a joint may gradually erode tissues and may penetrate inside the joint, subsequently infected and may lead to joint destruction and even limb loss<sup>2</sup>. For this reason, a foreign body should be suspected in cases of recurrent or unexplained soft tissue infections. Radiograph is normal if the foreign body is radiolucent but ultrasonography is helpful in these circumstances.

However, only high frequency ultrasonography is suitable for detection of foreign body which is still unavailable in all centers in Bangladesh. We recommend high resolution ultrasonography in the investigation if clinical history and radiography indicates that the foreign body is radiolucent or radiography fails to detect a radio-opaque foreign body clearly and in cases of suspected foreign body.

Ultrasonography for detecting a radio-lucent foreign body is a very easy method, but is almost unknown to majority of our young doctors. It can give accurate localization of the foreign body along with its measurement, so that its complete removal is ascertained. It can be done at almost all large centers in our country and can be done before operation again if the foreign body is having sharp ends which are considered advancing inside tissues.

Moreover, ultrasonography examination is economical in comparison to CT-scan and MRI if considered in the background of a poor country like ours.

## References

1. Anderson MA, Newmeyer WL, Kingore ES: Diagnosis and treatment of retained foreign bodies in the hand. *Am J Sur.* 1982; 144: 63.
2. Gooding Gaw et al: Sonography of the hand and foot in foreign body detection: *J Ultrasound Med.* 1987; 6: 441-447.
3. Russel RC et al: Detection of foreign bodies in the hand: *J Hand Sur [Am].* 10;163-176.
4. Flomm LL Ellis GI : Radiologic evaluation of foerihn bodies : *Emerg Med Clin North [Am].* 1992; 10: 163-176.
5. Marnix T. Van Holsbeek, Joseph H. Introcaso: *Musculo-skeletal ultrasound:* Mosby ed. 2; 393.
6. Donaldson J: Radiographic imaging of foreign bodies in the hands: *Hand Clin* 7. 1991; 125-134.
7. Mizel Ms, Steinmetz ND, Trepan E: Detection of wooden foreign bodies in muscle tissue, Experimental comparison of computed tomography, magnetic resonance imaging and ultrasonography: *Foot Ankle Int.* 1994; 15: 437-443.
8. Crawford R, Matheson AB: Clinical value of ultrasonography in the detection and removal of radiolucent foreign bodies: *Injury.* 1989; 20: 341-343.
9. Little CM et al: The ultrasonic detection of soft tissue foreign bodies: *Invest Radiol.* 1986; 21: 275-277.
10. Failla JM, Van Holsbeck MT, Vanderschueren G: Detection of a 0.5 mm. thick thorn using ultrasound – A case report: *J Hand Sur [AM].* 1995; 20: 456-457.

All correspondence to:  
**Joydeep Bhaduri**  
Consultant Sonologist  
Medipath Diagnostic Centre  
Rajshahi.