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Surgical retrieval of a retained broken needle in the gluteal region following an intramuscular injection: a case report.

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Abstract

A retained broken needle is a potential complication associated withintramuscular injections. Although they are uncommon, retrieving a broken needle can be challenging without the aid of an image intensifier. We report this case that was successfully retrieved without the aid of an image intensifier.

Keywords: *Retained, Broken, Intramuscular, Injection, Needle, Gluteal muscle.*

Introduction

Breakage of a hypodermic needle during intramuscular injection in the buttock is extremely rare. There are two reports in the literature: one by Chen GZ (1979)[1] and another by Singh J *et al* (2019)[2]. We present this case of a broken needle during an intramuscular injection of paracetamol into the gluteal muscle of a 7-year-old female, detailing the peculiarities of the surrounding events and highlighting the challenges with its surgical retrieval in the absence of an image intensifier.

Case Reports

A 7-year-old female child was brought to the hospital by her mother with a complaint of a retained needle in the left gluteal region after an intramuscular (IM) injection of paracetamol two days earlier. They were accompanied by a nurse who gave a detailed account of the incident. The nurse wanted to administer a stat dose of IM paracetamol to this child, who had a temperature spike at night. Before the injection, the nurse asked the child's pregnant mother to restrain her, but the child suddenly moved during the procedure, causing the needle to bend and detach from the hub. The paracetamol also spilled, and the nurse was unable to grasp the visible part of the needle as it was slippery. She decided to pick up a forceps to clamp it, but observed that the 22G needle had become completely embedded. The child had no complaints; however, the nurse and the child's parents were troubled and decided to seek help to get the needle out. On examination, several erythematous marks were found on the left gluteal region (Figure 1) with a very mild degree of tenderness. The needle was not palpable. The nurse, however, was certain about the injection site, which was between two other obvious injection marks on the buttock, as the child had received IM injection treatment initially for malaria on both gluteal regions.

An X-ray (Figure 2) revealed the presence of the needle in the depth of the left gluteal region. Surgical exploration and its attendant difficulties in the absence of an image intensifier were explained to the parents, and they consented. Under general anaesthesia, a transverse incision was made using the erythematous previous injection siteand the radiographas a guide. The incision was later converted to a cruciate incision as localization was difficult (Figure 3). The needle was retrieved from the depth of the gluteal muscles, and the wound was closed over a glove-drain (Figures 4 and 5). There was superficial surgical site infection and minor

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wound dehiscence, but the postoperative outcome was generally satisfactory.

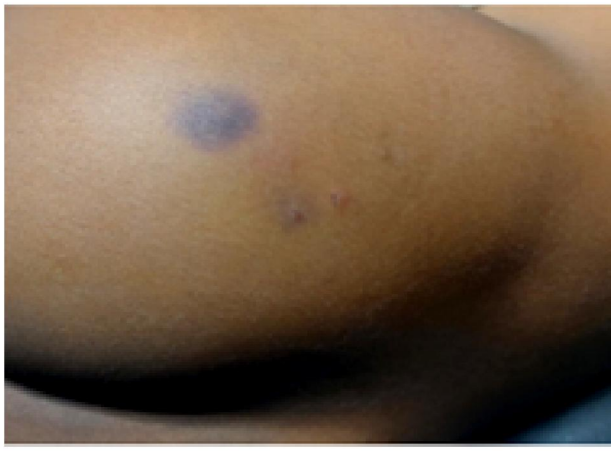

Figure 1: Erythematous marks of the gluteal regain indicating sites of previous injections.

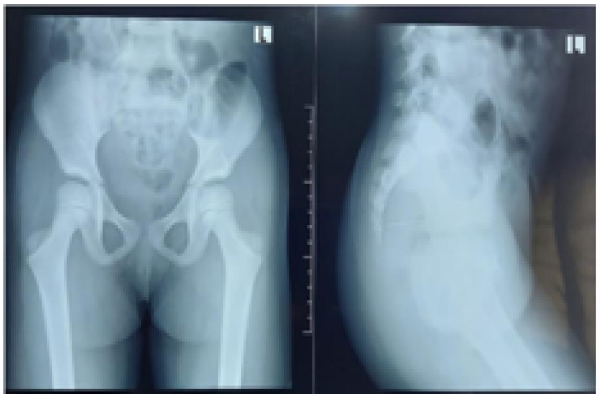

Figure 2: Plain radiograph showing a thin linear opaque structure within the gluteal muscles. The AP view shows the bent shorter part of the needle while the lateral view shows the horizontally oriented longer part.

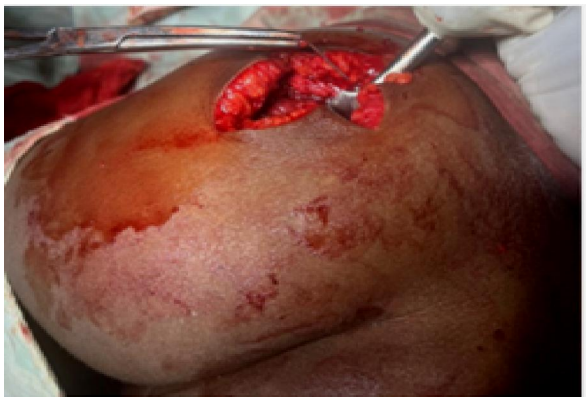

Figure 3: Intra-operative image of the child showing the cruciate incision and the needle retrieved.

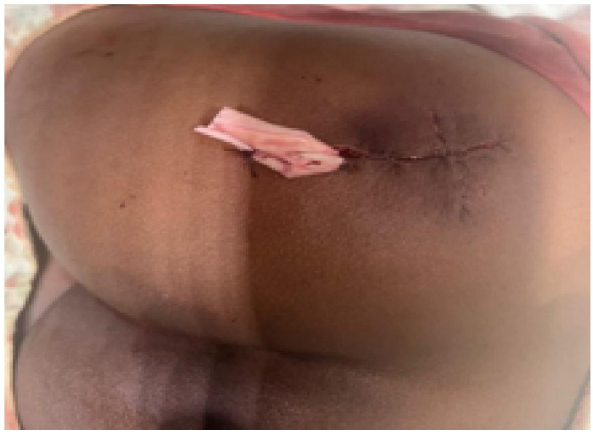

Figure 4: Cruciate incision closed over a glove-drain

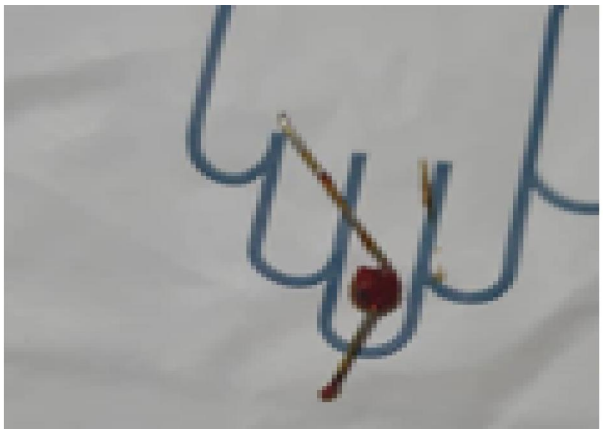

Figure 5: Bent and broken needle removed.

Discussion

Drug injection is one of the most common medical procedures. According to the World Health Organization (WHO), at least 16 billion injections are administered annually.[3] Generally, needle breakage is now very rare due to the modern design of stronger, disposable and single-use needles.[4] Nevertheless, such complication can still occur. Most reported cases of needle breakage occurred during dental procedures.[4,5,6,7] There are reports of needle breakage during surgical operations, percutaneous needle biopsy, bone biopsy, spinal anaesthesia and among intravenous drug abusers.[9,10] A single case report occurred in an obese woman with anarsaca during sampling of the femoral artery for ABG analysis.[9] This index case report is, to the best of my knowledge, the third reported case in the literature following intramuscular injection in the gluteal region.

Needle breakage is likely to occur with narrower needles, shorter needles, bent needles, poor injection techniques, when needle is inserted up to the hub, and with sudden movement of the patient during injection.[3,11] Inherent defects in the needle and injections into hard or scarred tissues or at sites closer to bones may also increase the risk of breakage. As reported, the area that was injected in this child was already scarred from previous antimalarial injections, and the child suddenly moved during the injection process, resulting in the bending and breakage of the needle.

A retained needle fragment may be asymptomatic or lead to chronic pain, infection, abscess formation, and granuloma development.[5] Migration of retained needles is not uncommon. Although there was no pain or swelling in the gluteal region of this child, the X-ray films showed that the needle had penetrated into the depth of the gluteal muscle. The continued movement of the child, seating position, and delayed presentation (up to 2 days) could have accounted for this.

There is no consensus on a management approach, even among dental practitioners, where needle breakage and retention are most commonly reported.[4,12,13] However, prompt localization and removal of the needle fragment is recommended by many as against the wait-and-see approach. This is to prevent the aforementioned complications and the unending anxiety associated with watchful waiting and potential medical litigation.[2,5] Imaging modalities like ultrasound, plain x-rays or computed tomography (CT) scans are useful in localizing the fragment before removal.[4,5] Aplain radiograph was used to confirm the diagnosis and localize the needle in this case. Exploration without the aid of an image intensifier (which provides real-time localization) is technically challenging and may lead to unwanted complications.[4] This was evident in the index patient's case, where an initial transverse incision was converted to a cruciate incision due to difficulty locating the fragment. This difficulty also contributed to the development of wound infection and dehiscence, which complicated the procedure.

Hypodermic needle breakage is a potential complication of intramuscular injection and can be prevented by ensuring proper injection technique and avoiding injection into scarred tissues or areas. A part of the needle distal to its hub should be exposed above the skin so that, in the unlikely event of any breakage or detachment of the needle from its hub, the broken fragment will be easier to remove. Embedded and retained needles should be localized and removed promptly, preferably using image-guided surgery. Where real-time image guidance is not possible, planned exploration must be performed meticulously using generous surgical access.

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