SURGICAL PROCEDURES IN GENERAL PRACTICE

This is one of a series of articles contributed by invitation

FOREIGN BODIES IN THE TISSUES

BY

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The removal of foreign bodies from the tissues can be a humiliating and a time-consuming experience, but a preliminary study and preparation will eliminate much of the usual difficulty. Foreign bodies in the eye and the respiratory, alimentary, and urinary tracts are not dealt with in this article, nor are wartime missiles.

In general practice and hospital service three types of foreign body are commonly met with: (1) hypodermic needles in the arm and buttock; (2) domestic needles and pins in the hands and feet; (3) miscellaneous substances—glass, wooden splinters, shot, metal filings, pieces of clothing, etc.

Hypodermic Needles

Treatment with insulin at home and the large amount of injection therapy now given result fairly often in hypodermic needles being broken in the tissues. Apart from the surgical aspect a medico-legal point is raised, and a working rule can be laid down that even though the needle fragment is in a situation where it is apparently innocuous the patient or his guardian must always be informed, a radiograph taken, and removal advised. If intervention is thought to be of doubtful value, then a consultation with a colleague should be sought and a considered opinion expressed, thus safeguarding both patient and practitioner.

An embedded hypodermic needle may exert a bad effect on the patient's health, as the following case illustrates:

A diabetic girl aged 20 was given insulin twice a day by her mother; she took a generous diet and kept sugar-free. One day a hypodermic needle broke in her arm, and after this, although more insulin was given and the diet was reduced, the glycosuria returned. She was admitted to hospital, where the needle was located by radiographs, but its extraction was deferred until the urine was sugar-free, owing to the possible danger of spreading infection in the wound. After a month's treatment the sugar persisted, and the opinion was formed that there was low-grade sepsis about the needle which exerted a toxic effect on the islets of Langerhans; consequently the needle was removed. There was a bead of pus around it, although no external signs of inflammation were visible. The next day the patient was sugar-free and has remained so.

It is common knowledge that hypodermic needles almost invariably break at the same place—that is, the junction of the shaft with the syringe piece, where the old-type plated needles of carbon steel corrode; the newer stainless needles, which bend rather than fracture, are better. Before giving an injection the point of the needle should always be inspected and tested, and from time to time it will be found broken off or bent over; a blunt needle has indifferent penetrating power.

Domestic Sewing Needles

Domestic sewing needles are a more difficult problem. They often penetrate deeply, perhaps between the metacarpals or metatarsals; besides which, some patients delay seeking treatment until the point of entry has healed and cannot be seen. Stories of a fortuitous spontaneous evacuation some distance away from the original wound are common, but such occurrences are exceptional.

Treatment

It is a *sine qua non* that all parts containing foreign bodies, suspect or actual, must be radiographed in two or more planes before removal is attempted. Stereoscopic films are a further assistance. Unfortunately, not all articles are opaque to x rays, but it is surprising what an amount of detail a good film will show.

Objects buried in the tissues should never be removed without: (1) access to an operating theatre or an x-ray table arranged as an operation table; (2) a good light; (3) preliminary radiographs in two or three planes, or a portable x-ray apparatus; (4) plenty of time; (5) an anaesthetic—local infiltration, spinal, or general; (6) when possible, exsanguination of the part by a tourniquet; (7) the patient being admitted to hospital or a nursing home.

The incision should be planned with due regard to the anatomical structures—for example, avoiding nerves, tendons, and arteries. An approach transverse to the axis of the needle must surely strike it, and should be used when permissible. The x-ray film is but a shadow: film distances and sizes are misleading, and must be estimated in relation to palpable bony points rather than by measurement on the negative. Thus "one inch below the radial styloid" will not be satisfactory, but a proportion of the distance between the ulnar and radial styloids—for example, a half or a third—is likely to be less erroneous. Further precise assistance is available from one of the following methods, modified according to the individual problem.

A long straight cutting needle is inserted into the part, aimed to strike the middle of the foreign body. Then a second needle at right angles to the first is similarly introduced. Lloyd (1936), writing on foreign bodies about the tarsals and metatarsals, advises the use of a Kirschner wire in the same manner, whilst a further aid to orientation is the insertion of a Michel's clip or clips into the skin. X-ray films in two positions are then taken, and from them the surgeon estimates the lie of the foreign body and plans the incision accordingly. If the guide needles are wide of the mark they are reinserted, or additional ones are used and more films are taken. The time spent in this preliminary investigation obviates tedious fumbling operations, with possible injury to important structures; in fact, the actual extraction often proves to be easy.

Harris (1936) describes a practical point that assists in the location of a recently entered foreign body. He states that as the needle penetrates it makes a track of ruptured capillaries and contused tissues, with a small extravasation of blood, and that if the part is completely exsanguinated this track remains red, brown, etc. (according to its age), and is clearly visible. It is traceable for several weeks after the accident. The limb is elevated for five minutes and an Esmarch bandage is applied. The position of the needle is estimated from the history and the radiograph, and the incision passes through the exact or an approximate point of entry. The dark red track, now easily identified in the white glistening tissue, is carefully followed to the foreign body. The method is applicable only to bodies in the upper and lower limbs, not for the buttocks. Caution in the use of a tourniquet on the arm and forearm is always necessary, for a median or ulnar palsy is rapidly caused; good padding and the minimum

of tension for the shortest period possible are the points to observe to avoid this complication.

Another method of attack is advised by Chitty (1936). After the preliminary tourniquet the area is infiltrated with novocain, and, if the body is opaque to *x* rays, then under the fluorescent screen a hypodermic needle is inserted into the tissues guided by the history and the radiographs, probing until its point touches the foreign body. The light is turned on, the part incised along the needle, and the object located. In some cases it is an advantage to use two needles, directing the shafts approximately at right angles to each other, and on localization the incision is made between them.

In spite of these aids the operator may fail to detect the foreign body; then with the uncovered sterilized finger palpation of the wound tissues is helpful: the naked finger is more sensitive than the rubber-gloved hand. In the buttock, however, the meshes of connective tissue are dense; they feel hard and grate almost like a foreign body, so that in this situation digital palpation is of limited value. Despite its usefulness digital palpation is not the method of choice in seeking foreign bodies in a wound, although admittedly it is sometimes necessary under the *x*-ray screen. Wounds from which foreign bodies have been removed should be but loosely closed; a drain is often advisable, and always so if sepsis is apparent.

Fish-hooks and Crochet Needles

A fish-hook or crochet needle usually only partly penetrates a finger or hand. In such a case the part should be disinfected, anaesthetized by 1 per cent. novocain or 1 in 1,000 pantocaine, and the article grasped and pushed (not pulled) so that it emerges through the skin, which is snicked where the head presents. The bulbous or barbed extremity—for example, a crochet needle—is pressed on until the head protrudes; it is then cut off with wire-cutting forceps or pliers and the stump withdrawn. Incision or set operation is rarely necessary.

Sewing-machine Needles

A finger may be trapped by a sewing-machine needle, which passes through the nail, the phalanx, and the pulp of the finger; then, by a combination of bending and snatching away of the hand, the needle breaks. In this event the pulp of the finger should be anaesthetized and the finger pressed hard down on to a metal plate; the point of the needle is thus forced to retrace its path through the bone, and the fractured end appears under the nail. A little manipulation or enlargement of the hole of entry suffices for the needle to be seized with an artery forceps and extracted.

Miscellaneous Objects

Many foreign bodies—for example, wood, glass, aluminium, clothing, fish-bones, etc.—are not opaque to *x* rays. They are often associated with a wound which, whether a foreign body is suspected or not, should be treated as if it were infected, carefully explored, probed, and if necessary extended, the contused tissue being excised. Lacerations containing or suspected of containing glass require detailed search, as the sharp fragments travel unexpected distances. This surgical treatment will locate articles and missiles known and unknown, and it avoids infection and complications.

Occasionally a wound containing glass or a splinter will heal; a capsule of fibrous tissue forms around it, and no further trouble may be experienced. On the other

hand, the area may become painful to touch, causing the patient to seek advice. If the discomfort is constant and a nodule is palpable, exploration of the part is indicated. Glass fragments and needles are not as a rule heavily infected, and wounds containing them often heal by first intention. Lacerations contaminated with wooden splinters, metal filings, fish-bones, and pieces of clothing usually suppurate. All wounds below the knee, including superficial abrasions, must be given prophylactic anti-tetanic serum.

Gravel Rash

In cases where the foreign particles have not been removed, gravel rash of the face and hands heals with a disfiguring scar, which is only corrected by an extensive plastic operation; consequently every effort should be made to extract the whole of the foreign matter early after the injury. Under an anaesthetic the wound must be assiduously cleansed—this requiring considerable time—but not sutured, and compresses of 12 per cent. sodium sulphate should be applied four-hourly until healing is complete. The hypertonic action of these applications encourages extrusion of possible remaining particles; but their extraction is essentially the surgeon's responsibility, and demands patience, resource, and resolution.

Splinters

Splinters, if visible, are easily recovered by forceps, unless the wood is rotten, when the incision must be enlarged to allow of complete extraction. Metal filings are often oily and infected. In addition to scrupulous cleansing the wound must not be sutured, and a drain should be inserted.

Pellets

Pellets from air-guns and sporting guns are met with in civil hospital practice. Less often the plug of a blank cartridge may cause a wound. Although this paper is not intended to include these types of injury, two essentials are worthy of mention. The first is that the wound should never be closed after removal of the foreign body even though a joint be involved; and the second, that anti-tetanic serum should always be given.

REFERENCES

- Chitty (1936). *British Medical Journal*, 1, 446.
Harris (1936). *Ibid.*, 1, 386.
Lloyd (1936). *Ibid.*, 1, 310.

ROYAL MEDICAL BENEVOLENT FUND

At a recent meeting of the committee three annuities and thirty-four grants were awarded. The total amount voted was £995.

One of the recipients was a doctor who is quite unable to practise owing to paralysis. He is married and has one child of school age. His grant was renewed for the fifth year in succession. The following letter has been received in acknowledgment:

"It has not been possible owing to my paralysis for me to write to you before, but now I have a typewriting machine on which I can tap with one finger of my left hand. It gives me great pleasure to address you personally. I am truly grateful for all the Fund has done in the past and is doing at the present time on my behalf. The Fund is truly a marvellous society. I do not like to think what our position would be without your magnificent help. I beg to convey my own and my family's most sincere thanks to the Committee."

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