

clotted within 30 minutes and had separated after overnight incubation. At pH 1 it solidified instantly, later to separate. In further testing to establish why this did not happen *in vivo* Osmolite was mixed with pepsin and adjusted to pH 1. The mixture became frothy, and solidification was considerably inhibited. A gastric aspirate from the patient was found to be pH 4.

### Comment

Our *in vitro* tests showed that Osmolite suspension solidified at a low pH; it had the same macroscopic appearance as the clotted material removed from the patient, which was not analysed further. *In vitro* tests also showed that the solidification of Osmolite was prevented by a high concentration of pepsin. In patients with a partial gastrectomy the pepsin concentration is reduced and digestion therefore impaired, and thus the gastric pH may be low enough to cause solidification. This would be enhanced by slow gastric emptying, which occurs when opiates are given<sup>1</sup> and after major trauma.

Nasogastric feeding is by no means free of complications, but we do not think that this serious unusual complication has been reported before.

We thank Dr A K Wielogorski and Mr F Shabbo for their permission to report on one of their patients and Dr P O'Gorman, consultant pathologist, for his help and advice.

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### Brook General Hospital, London SE18 4LW

A MYO, MB, DA, anaesthetic registrar  
P NICHOLS, MB, BCH, anaesthetic registrar  
M ROSIN, FRCS, cardiothoracic surgical senior registrar  
G D R BRYANT, FRCS, general surgical registrar  
L M PETERSON, FIMLS, senior medical laboratory scientific officer

Correspondence to: Dr Myo.

## Dependence on dextromethorphan hydrobromide

Dextromethorphan is a cough suppressant which is often used with an antihistamine in treating unproductive cough. It has no analgesic or sedative properties.<sup>1</sup> Some limited and sporadic abuse of dextromethorphan has been reported,<sup>2</sup> including a case of toxic psychosis in an addict who had taken 20 tablets of dextromethorphan.<sup>3</sup> There are no recent published reports of its misuse, however, and neither the Home Office drugs branch nor the British manufacturers have received any reports of its misuse (personal communication). Indeed, the World Health Organisation concluded that there was no evidence to warrant its international control as a narcotic.<sup>4</sup> I describe a case of regular misuse of pure dextromethorphan.

### Case report

A 30 year old man was admitted to the Wessex regional drug dependency unit for treatment of supposed amphetamine dependence. He had a four year history of drug misuse, which began with smoking cannabis; this was followed by amphetamines and barbiturates, which he took orally. There was no evidence of opiate misuse. After release from a six month prison sentence in the autumn of 1985 he started regularly to obtain a white powder which he believed was an amphetamine of high purity. He had bought the drug in London from a contact who apparently worked in a laboratory; it was sold at £15 a half gram on the black market.

The patient "snorted" the powder—that is, sniffed it up both nostrils—and after about 15 minutes described himself as feeling "high," "out of my head," and "on top of the world." He became restless and could not sit still. The effect lasted up to two hours, after which he felt depressed, tired, and occasionally dizzy and nauseated. He did not experience any paranoid feelings. He used the powder two or three times daily, never taking more than a quarter of a gram at one time. Sometimes he also smoked cannabis to enhance the effect. He used the powder regularly for two to three months.

There was nothing important in his past or family history, and there was no relevant medical history. He had asked for help because of pressure from his family and cohabitee. His mental state was unremarkable and physical examination showed no abnormalities. He exhibited no particular withdrawal symptoms but complained of a continued craving for the drug. Analysis of a sample of the white powder showed that it was pure dextromethorphan hydrobromide.

### Comment

This unusual case shows again that any drug with central nervous system activity may be misused. Abuse of expectorants and cough suppressants is well recognised. These may be in the form of a suppressant alone (codeine or dextromethorphan) or in preparations containing an antihistamine or pseudoephedrine.<sup>4</sup> A paranoid psychosis has been described in a patient who admitted abusing Actifed (a proprietary decongestant and antihistamine) for many years.<sup>5</sup>

We need to be continually alert to the drugs that addicts are taking. Bona fide pharmaceutical products may find their way on to the black market, as in this case, or may be manufactured illegally. One way to keep track of these developments would be for drug dependency units to analyse suspicious drugs more often.

I thank the Wessex Regional Pharmaceutical Quality Control Laboratory at Queen Alexandra Hospital, Portsmouth, for analysing the dextromethorphan hydrobromide.

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### Wessex Regional Drug Dependency Services, Northern Road Clinic, Cosham, Portsmouth PO6 3EP

PHILIP M FLEMING, MA, FRCPSYCH, consultant psychiatrist and director

## A complication of capillary glucose monitoring

I describe a patient with diabetes mellitus who developed infected gangrene of the tip of one finger, caused by multiple stabs to monitor capillary glucose concentrations.

### Case report

A 66 year old man was transferred to the department of medicine for the elderly for rehabilitation after a stroke. He had suffered from diabetes mellitus for 14 years, controlled with diet alone but complicated by early proliferative retinopathy and nephropathy. After the stroke he had received tolbutamide 500 mg twice daily, and his average blood glucose concentration fell from 14 to 8 mmol/l (252 to 144 mg/dl).

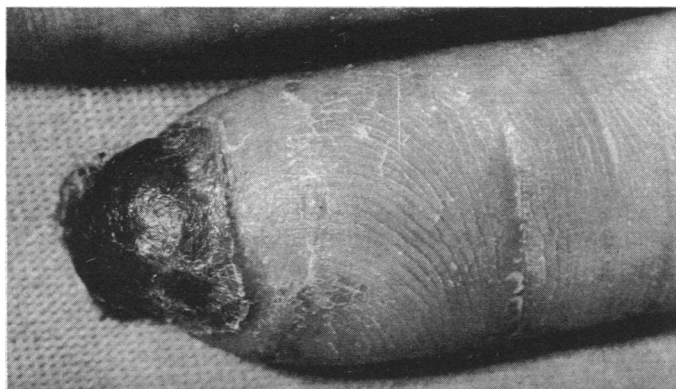
Assessment on transfer showed that he still had a pronounced left sided hemiplegia. He had peripheral vascular disease affecting his legs but no peripheral neuropathy. He also had evidence of small vessel disease affecting his fingers and hands. Examination of the fundi showed background retinopathy on the left side and early proliferative retinopathy on the right side.

Over the next few weeks he complained increasingly of pain at the tip of the little finger on his right hand, the site of multiple stabs to obtain samples of capillary blood to assess his diabetic state. These stabs were performed by nursing staff, using either a lancet or a disposable 25 gauge needle without the guidance of a device such as an Autolet. Skin preparation was adequate. His condition progressed to infected gangrene of the soft tissues of the pulp of the finger (figure). The underlying bone was not affected. At this time his mean blood glucose concentration was 16 mmol/l (288 mg/dl). With potassium permanganate soaks the infection subsided, and antibiotics were not prescribed. The dead tissue separated slowly without surgical intervention.

### Comment

The use of capillary blood to monitor glucose concentrations is widely accepted, and this can be carried out at home or in hospital. Blood is usually obtained from fingertips, and whether a lancet or hypodermic needle is used or a device such as an Autolet, which limits the depth of penetration of a lancet, all methods are described as being safe and efficient.<sup>1 2</sup> In particular, Judd and Sonksen emphasised that pulp infections have not yet been encountered in many thousands of finger pricks.<sup>2</sup> Two cases of finger sepsis have, however, occurred in patients with shunts in their arms for haemodialysis.<sup>3</sup> Infection of the flexor tendon sheath has also been reported.<sup>4</sup>

The complication that the patient in this study experienced is considered unusual. The pulp infection and gangrene could have occurred for several



Tip of little finger of right hand with infected gangrene.

reasons. Stabs were mostly performed on only one finger, and in particular one hand, to avoid disturbing the paralysed arm. The patient was subjected to frequent stabs when blood glucose concentrations remained satisfactory. No device was used to limit penetration of the skin, which might have been too deep. He also had clinical evidence of small vessel disease affecting his arms.

Although pulp infection and gangrene are unusual complications of finger pricks to obtain capillary blood, they are still possible and may be prevented. Just as Young *et al* emphasised the importance of inspecting insulin injection sites regularly,<sup>5</sup> we would suggest that similar caution be paid to sites used to obtain capillary blood. A proper technique must be adhered to, and in particular it would seem wise to use several fingers in rotation and a device to limit skin penetration. Repeated stabs should be kept to a minimum. The site chosen should be clean and warm, but alcohol swabs should not be used, as repeated use tends to toughen the skin. If impaired blood supply to the finger is suspected other sites such as earlobes should be considered seriously.

I thank Dr Patrick Neligan for his helpful criticism during the preparation of this article and Dr James Cox for his encouragement.

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Department of Medicine for the Elderly, Kingston General Hospital, Hull  
ANTHONY FIORINI, MB, MRCP, registrar

## Injuries from nail gun cartridges: a dangerous new game

In the past 20 years there have been several reports of injuries due to nail guns.<sup>1-3</sup> In all these cases the injury was caused by a nail penetrating the victim's body. There appear to be no reports, however, of injuries caused by shrapnel from exploding cartridges. In Manchester recently there has been an epidemic of admissions due to this type of shrapnel injury. In every case the history has been the same. Adolescent boys have found discarded, live cartridges from nail guns while playing, unsupervised, with friends. The "game" is to throw bricks at this ammunition and watch it explode.

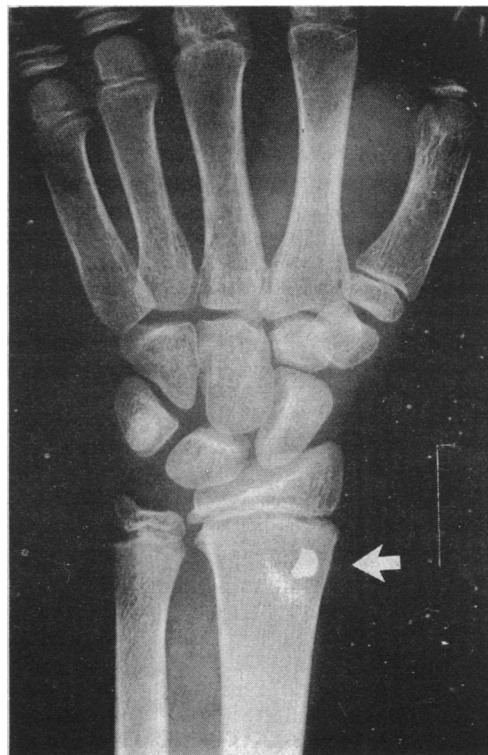
We report two case histories highlighting the type of injury sustained.

### Case reports

A 14 year old boy was admitted with a wound in his left thenar eminence. A radiograph confirmed that there was a metal foreign body lodged in the soft tissues of his left hand but no skeletal damage. Initial treatment consisted of a sterile dressing, tetanus toxoid, and parenteral antibiotics. He was quickly taken to theatre, and the wound was explored under general anaesthesia with the use of an arm tourniquet. The shrapnel was removed, the wound was thoroughly

irrigated with saline and hydrogen peroxide, and minimal debridement of the edges of the wound was undertaken. There was no neurovascular damage, and the wound healed with no complications.

A 12 year old boy was admitted with a wound on the radial side of his right wrist. A metal foreign body was again confirmed to be lodged in the soft tissues with no bony damage. Initial treatment was as described above, and he was also taken to theatre. The shrapnel was embedded in the extensor carpi radialis tendon, which was partially lacerated (figure). The wound was irrigated copiously, and minimal debridement was undertaken as before. Again there were no complications.



Piece of shrapnel lodged in soft tissues.

### Comment

The nail gun, when charged with the high explosive cartridge, is capable of firing a nail 10 cm into fully stressed concrete.<sup>4</sup> Therefore, if this cartridge is detonated with a brick it will explode with a large amount of kinetic energy. This results in a ragged projectile with potentially high velocity.

Interviews with the victims and their parents suggested that these cartridges may be found lying around in large quantities on open ground. Throwing of bricks at these cartridges to watch them explode is becoming a common game among adolescent boys. One of the fathers said that he had notified the authorities about the potential danger of these cartridges. He alleged that the authorities admitted that they could not or would not safely dispose of this live ammunition as they claimed that this was not their responsibility. He was unable to find the responsible body.

The worrying aspect of this new game is that a more serious injury is bound to occur unless the dangers are recognised and these cartridges are disposed of safely. People using these guns legitimately must act responsibly and not leave live ammunition around.

I thank Professor C S B Galasko and Mr S G W Gough for allowing me to report on their patients.

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Royal Manchester Children's Hospital, Pendlebury, Manchester  
R W PATON, FRCS, orthopaedic registrar

Correspondence to: Mr R W Paton, 30 Peckforton Close, Gatley, Cheadle, Cheshire.