ACCIDENTAL INJECTION OF THIALBARBITONE INTO AN ANOMALOUS RADIAL ARTERY

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SUMMARY

A case is reported in which it is believed that thialbarbitone (Kemithal) was inadvertently injected into a duplicated radial artery.

The dangers of accidental injection of thiopentone into an artery are well known but the author has been unable to trace a report of a similar complication with thialbarbitone (Kemithal). The following report describes such a case.

CASE REPORT

A woman aged 22 was admitted for dilatation and curettage. Atropine sulphate 0.6 mg was injected intramuscularly before operation. A 10 per cent solution of thialbarbitone (Kemithal; ICI) was prepared. As the veins near the elbow were not visible, a vein on the radial aspect near the right wrist was selected for injection. As the injection proceeded, the patient complained of burning pain in the right hand. The injection was stopped and the radial artery palpated. After confirming the presence of pulsation in the radial artery at its normal site, the injection was continued. The patient was asked whether she still felt the pain but she said that she was now comfortable. At this stage about 5 ml had been injected and the patient fell asleep. When a further 2 ml had been given the anaesthetist noticed abnormal movements of the fingers of the right hand and cyanosis of the fingertips. The injection was stopped at once. By this time the operation was over. The right hand was kept under observation. After 2 hours the whole hand became oedematous, swelling being more marked on the thenar eminence and in the region between the index finger and the thumb (figs. 1, 2, 3). The thumb and index finger were in a partially flexed position and movements were restricted. The hand was splinted and kept elevated in a sling. By the third day the oedema had diminished but ulceration had developed on the thenar eminence and in the web between the thumb and index finger. The patient was asked to report daily. After 15 days the oedema subsided and the ulcers healed but the movements of the thumb and index finger remained restricted. About 2½ months later the thumb and the index finger were still in a semiflexed position with all the movements limited. Tenotomy was undertaken to improve the movements of the two fingers. When the patient was seen a fortnight after tenotomy there was improvement in flexion and extension movements but adduction and abduction of the index finger and abduction in the thumb remained limited.
FIG. 3
Right hand showing oedema and blisters in the region of the thenar eminence.

DISCUSSION
The risk of accidental intra-arterial injection is greater in obese patients because suitable veins are often not well seen. Injections may also be made into anomalously placed arteries. According to Cohen (1948), intra-arterial puncture is not necessarily followed by a gush of blood pushing back the syringe piston; often definite aspiration is required. In the present case, the accident was not suspected when the patient first complained of pain (as she soon went to sleep) and was only presumed when the fingers became cyanosed. It was therefore felt that it was too late for treatment by vasodilators and sympathetic block. The pulsation of the radial artery was felt at the usual site and hence it was thought that the injection had been made in an anomalous radial artery. After the event, the pulsation of the radial artery was still well felt at the normal site and no pulsations were felt at sites at which a duplicated or anomalous radial artery might be found, possibly because the anomalous artery had already gone into spasm. If the accident had been suspected immediately after the patient complained of pain the complications could have been minimized by cessation of injection at that site and by prompt institution of the usual measures to prevent the onset of spasm and thrombosis.

Treatment was, in fact, restricted to symptomatic measures such as rest to the part (sling, etc.), analgesics, local application of ointments and later, tenotomy.

In this case it is thought that the injection was given into a duplicated radial artery, one branch of which was running very close to the cephalic vein.

Variations of the radial artery have been described. Charles (1894) recorded a case of absence of the radial artery, its place at the wrist being taken by the anterior interosseous artery winding round the radial border of the wrist underneath the long tendons of the thumb and entering the palm between the first and second metacarpal bones in the manner of a normal radial artery. McCormack, Cauldwell and Anson (1953) found among 107 radial arteries arising abnormally high, one in which the radial artery was duplicated in its entire length. There were five in which the artery was divided into two branches in the distal fourth of the forearm, one branch running superficial to the tendons of the long dorsal muscles of the thumb and entering the palm between the first dorsal interosseous muscle and the head of the second metacarpal bone, while the other branch formed the radial portion of the deep palmar arch, after providing a strong contribution to the thumb and the index finger.

Occasionally the radial artery may run a superficial course, or it may pass to the back of the wrist crossing superficial to the brachioradialis and the extensor tendons of the thumb.

Among the branches of the radial artery the dorsal digital artery of the index finger may be large and replace the princeps pollicis and the radialis indicis. Likewise, the princeps pollicis and radialis indicis arteries may be absent, their place being taken by branches of the superficial palmar arch.

The misplaced injection gave rise to arterial spasm and later thrombosis. Venous thrombosis may have also contributed to the condition. Another possibility could be that the injection was made into the cephalic vein but leaked partially, giving rise to arterial spasm of a very closely running duplicated artery.

Since the occurrence reported in this paper the author has made it a rule to look for evidence of
ANOMALOUS RADIAL ARTERIES. A CLASSICAL CASE OF
DUPLICATED RADIAL ARTERY WAS DISCOVERED IN A
13-YEAR-OLD BOY ABOUT TO UNDERGO ANAESTHESIA. THE
SMALLER BRANCH OF THE ARTERY RAN IN THE NORMAL
POSITION AND ENTERED THE PALM OF THE HAND AND
THE LARGER BRANCH RAN QUITE SUPERFICIALY ALONG THE
COUSE OF THE CEPHALIC VEIN IN THE LOWER THIRD OF
THE FOREARM. TRANSMITTED PULSATIONS COULD BE FELT
EASILY OVER THE CEPHALIC VEIN. THIS VEIN WAS
AVOIDEI AND THE MEDIAL CUBITAL VEIN WAS USED FOR
INTRAVENOUS INDUCTION OF ANAESTHESIA.

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