INJURIES TO FEMORAL VESSELS DURING HERNIA OPERATIONS

BY

F. T. RANSON, M.B., B.CH.BELF., F.R.C.S.ED.

SHANGHAI

Most surgical textbooks mention the possibility of injury to the external iliac or femoral vessels during operations for hernia, but even in the larger textbooks the matter is dismissed in a few lines, and no account of treatment or sequelae is given. These injuries must be extremely rare; many surgeons of considerable experience to whom I have spoken have never seen or known of a case. Burrows¹ says that he has once seen the external iliac artery wounded, but he does not give details. He gives a reference, however, to the *British Medical Journal*, (1914, ii, 115), where O'Connor mentions two cases in which he himself injured the external iliac vein: a Chopart amputation was the penalty in one case; there was no penalty in the other. Coley² states that from personal communication he knows of four cases of injury to the large vessels during the insertion of deep sutures into Poupart's ligament. Thorek³ deals with the subject briefly, and gives but little information.

The best account of these injuries that I have been able to find is by Stich and Makkas,⁴ in their book on surgical errors. Although the surgeon is usually apprised of the fact that damage has been done to a large vessel by the copious haemorrhage which takes place, yet these authors say that the accident sometimes is unnoticed, as no bleeding occurs at the time, and they refer to two cases illustrating this. In one a man died of pulmonary embolism on the ninth day after an operation for inguinal hernia, and it was found that the femoral vein had been perforated. Burrows suggests that some cases of thrombosis after operations for hernia may be due to misadventures with the needle. In the other a patient returned to the clinic two months after a similar operation, with a small pulsating swelling below Poupart's ligament. This was exposed, and was found to be a traumatic aneurysm of the femoral artery. The artery was ligated and the sac excised; a hole the size of a lentil was found in the vessel wall, and the hole was traversed by a stout silk thread. In neither case was there any undue bleeding at the time of operation.

I have recently heard of a case in which the patient died of pyaemia, the result of injury to the external iliac vein. The following is an account of a case which I had the opportunity to study.

CASE RECORD

The patient, a male Indian aged 36, was operated on in 1926 by a French surgeon for double inguinal hernia. The hernia recurred on both sides. He consulted me, and on December 14th, 1932, I operated on both sides by the Gallie method. The left side was quite successful, but the right discharged some serum, and, after the operation, a little pus. The hernia recurred in about three months' time. I advised him to wear a truss, but, dissatisfied with his truss and with my advice, he consulted a German surgeon, who again operated on the right side on June 12th, 1933.

I have been unable to obtain accurate details of what happened at that operation; but as a suture was being inserted deep into the wound there was a sudden brisk haemorrhage. This the surgeon attempted to stop by passing a still deeper suture. This simply increased the bleeding, and he finally resorted to packing the wound with gauze. The wound bled freely for several days and became septic, but gradually healed, and the patient was discharged from hospital on August 2nd with a small sinus. He was readmitted on August 7th with a severe haemorrhage, arterial in nature. The wound was again packed with gauze, and a blood trans-

fusion was done. On August 18th he had another severe haemorrhage, and Dr. Bennett, superintendent of the Shanghai General Hospital, who saw him on this occasion, says that the haemorrhage was definitely arterial, and that jets of blood hit the wall two feet away from the bed. The wound was again packed with gauze and another transfusion performed.

On August 20th I was asked to see the case, in consultation, and to perform any further operation which might be necessary. It was explained to the patient that it would probably be necessary to tie the main artery to his limb, and that this carried the risk of gangrene of the foot and loss of the leg. He said he would wait and only have the operation done if he had another haemorrhage. At this stage there was a sinus just below the inner end of Poupart's ligament and a small pulsating swelling. No thrill or bruit could be detected.

On August 30th, at 6 a.m., he had another severe haemorrhage, and I was called to the hospital. I found the patient in the operating theatre, and a dresser was controlling the haemorrhage by digital pressure over a gauze pad, which had been tightly packed into the sinus. I at once administered spinal anaesthesia, and, after exposing the external iliac artery by the extraperitoneal route, tied this vessel. The sinus was then examined, but on releasing the pressure there was free venous haemorrhage. The sinus was at once enlarged, and a small arterio-venous aneurysm found just below Poupart's ligament. To stop the haemorrhage it was necessary to tie both the artery and the vein above and below the sac. As this wound was septic it was left open to granulate. The patient had lost a good deal of blood, and was given a transfusion of 500 c.cm. citrated blood.

Two days later the foot, which had been cold, became discoloured. This discoloration spread rapidly up the limb, and as it was obviously gangrenous the limb was amputated just above the knee on September 14th. After this the patient had some fever and increased pulse rate, but he rapidly improved, and is now completely healed. He has been fitted with an artificial limb.

DISCUSSION

Accidents of this kind have happened in the hands of very expert operators, and it is necessary to know how to deal with them. If, as happens in the majority of cases, the injury is at once followed by haemorrhage, the ideal procedure is undoubtedly exposure and suture of the vessel wall. The very fine needles and thread advocated for experimental work are not necessary. Most operating rooms could, however, supply fine needles and silk such as are used in ophthalmic surgery, and these are quite suitable.

By courtesy of Mr. John Gray, F.R.C.S., of the Henry Lester Institute of Medical Research, I have been enabled to carry out experiments in arterial suture. It was found possible successfully to suture incisions in both the aorta and the femoral arteries of small dogs with Kalt's conjunctival needles and very fine silk. The vessel can be held up by an assistant on tapes or rubber tubes; this gives excellent access, and controls bleeding during the suturing. It is not necessary to use paraffin or vaseline on the needles and thread. Human hair, which is readily available and is easily sterilized, is suitable material, and it is easier to thread these fine needles with hair than with silk. A vessel the size of the femoral artery in man could certainly be securely sutured with these materials.

If, for any reason, suture were impracticable or failed, then it would be necessary to resort to ligation. Authorities differ as to the risk of ligation of the common femoral trunk. Wolf, quoted by Stich and Makkas, says that in 25 per cent. of cases gangrene follows. Rowlands and Turner⁵ stress the risk of gangrene, but Reid and Andrus⁶ state that in the absence of infection one should be able to tie the normal femoral artery in any part of its course with no untoward result. Dr. Loucks, head of the department of surgery in Peking Union Medical College, to

whom I am indebted for helpful comments, is of this latter opinion, and considers that the gangrene which ensued in my case was due to interference with the collateral circulation by infective thrombosis. It is commonly taught that where it is necessary to ligature the main artery to a limb, ligature of the main accompanying vein at the same time will diminish the risk of gangrene, but the results of the experimental work of Wilson⁷ do not support this view.

The treatment at a later date depends upon the conditions present, whether traumatic aneurysm, arterio-venous aneurysm, or haemorrhage. If I were treating a similar case again I would not put a permanent ligature on the external iliac artery, although Lejars⁸ recommends this procedure. It would have been preferable to occlude the vessel temporarily by a special clamp, or by a knot tied over a piece of drainage tubing the calibre of the vessel. As, however, it was necessary to tie the common femoral trunk, and as there was marked infection of the wound, gangrene would very probably have ensued whether the external iliac were patent or not.

Proximal ligature of the external iliac alone has been suggested and has been carried out in similar cases, but it is universally held to be unsatisfactory.⁹ Even though the wound is in the artery alone, the haemorrhage is almost certain to recur; and, naturally, if both artery and vein are involved the measure is useless. Whatever method of proximal control of the circulation be adopted,

the wound must always be explored and the actual bleeding point dealt with.

A colleague informs me that in 1914, in London, he saw the femoral vein wounded during a hernia operation by a well-known surgeon while he was demonstrating to a group of visiting American surgeons. In these embarrassing circumstances the surgeon dealt with the situation very coolly. He said: "Gentlemen, this gives me the opportunity to show you how to deal with this accident," and he proceeded to expose and ligature the vein. The patient made an excellent recovery.

One hopes never to have the misfortune to injure a large vessel; but in the event of such an accident it is well to have a clear idea of the treatment, and to be able to repair the damage by some simple method and with needles and appliances which one might expect to find in most operating rooms, for the needles, suture materials, and special clamps usually described in operative surgery books are unlikely to be at hand in an emergency.

REFERENCES

- ¹ Burrows: *Pitfalls of Surgery*, 1925, p. 221.
- ² Coley: *Keen's Surgery*, 1916, iv, 38.
- ³ Thorek: *Surgical Errors and Safeguards*, 1932, p. 403.
- ⁴ Stich and Makkas: *Fehler und Gefahren bei Chirurgischen Operationen*, 1923, p. 754.
- ⁵ Rowlands and Turner: *The Operations of Surgery*, 1927, i, 862.
- ⁶ Reid and Andrus: *Living Surgery*, 1927, i, 778.
- ⁷ Wilson: *Brit. Journ. Surg.*, 1933, January, p. 393.
- ⁸ Lejars: *Urgent Surgery*, 1923, p. 751.
- ⁹ Rowlands and Turner: *The Operations of Surgery*, 1927, ii, 885.

Clinical Memoranda

RESUSCITATION AT BIRTH BY EVE'S ROCKING METHOD

I had been much impressed by the simplicity and ease of the rocking method of artificial respiration described and originated by F. C. Eve.¹ Its physiological soundness was demonstrated in a further paper by Eve and Killick.² Hence I determined to try this method in asphyxia of the newborn when occasion should arise, and such was the case last Christmas Eve.

The mother was debilitated by influenza and had three previous children. Uterine pains were very feeble throughout a long labour. When the cervix had at last dilated the child was easily delivered by forceps—white, and making no attempts to breathe. The heart was just audible with the stethoscope.

I did the rocking in front of the fire, seated, holding the infant on the palms of my hands face upwards, the legs dangling free, the buttocks being supported and restrained by the left first finger and thumb, the head and neck by the right first finger and thumb. After a few attempts with the child naked, I covered the trunk in a small towel, which facilitated matters. I found that the fingers adapted themselves to the small body, and that the thumbs and first fingers were used instinctively to check any slipping when the infant was tilted, so that the weight of the viscera alternately pushed and pulled the diaphragm up and down. The rocking movements were performed up and down, about fifteen double "rocks" to the minute (ten are advised). I changed the position of the child to face downwards, but found that was not so easy to manipulate.

After the first minute air was heard coming in and out through the air passages. After twenty-five minutes I put the child into a warm bath, but found that breathing did not go on. It was not until after a total of fifty minutes' rocking that natural respiration was established, when there was some crying, and my task was done.

For general practice, and after a single case only, I consider that Eve's method is an ideal one, and

especially for a very feeble child. There is no violent handling as there may be in other methods of artificial respiration. With supervision it could be performed by anyone of ordinary intelligence, and it could be done in a box-lid, or on the knees with some manipulation. It is a natural method after all, and has materialized from the dawn of the earliest birth—to be adapted by its originator and first published in a scientific paper in 1932. I venture to report this case for publication because I believe it to be the first recorded instance of resuscitation at birth by Eve's rocking method.

Malton.

NOEL C. FORSYTH, M.D.

FIFTY-ONE STOKES-ADAMS ATTACKS IN FIVE DAYS IN A CASE OF DIPHTHERITIC HEART-BLOCK

It is well known that, at the onset of complete heart-block, attacks of syncope may occur at frequent intervals until the ventricle settles down to beat at its own rhythm. The following case is remarkable for the number and the severity of the attacks.

* A boy, aged 17, was admitted to the East Malling Isolation Hospital on October 23rd, 1933, with a history of a sore throat for two days. He was suffering from a very severe attack of faucial diphtheria. The whole of both tonsils, anterior pillars, and uvula were covered with a foul sloughing membrane. There was severe cellulitis and oedema of the neck, which extended over both clavicles and over the sternum to the level of the second ribs. The patient was given 32,000 units of antitoxin, and in three days the swelling of the neck had disappeared. Two days later the throat was clear of membrane, and the acute faucial stage had been safely passed. On the sixth day of the disease (October 26th) albuminuria appeared, which got progressively worse until October 31st, when there was a heavy cloud of albumin, and only twelve ounces of urine were passed. The general condition was fairly satisfactory and the heart normal.

It was on November 1st, the twelfth day, that heart-block appeared, associated with a remarkable series of Stokes-Adams attacks. I saw the patient at 12 noon, and the

¹ *Lancet*, November 5th, 1932. ² *Ibid.*, September 30th, 1933.