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ARTERIOVENOUS FISTULA AS A COMPLICATION OF OPERATION FOR PROLAPSED DISC

By

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Perforation of large vessels is a rare complication of operation for prolapsed disc. Most of the reported cases in which perforation of a single vessel occurred ended fatally. When there is simultaneous rupture of an artery and a vein the prognosis is better, even though an arteriovenous fistula with ensuing severe symptoms results. *Horton*, in 1961, collected from the literature a series of cases of arteriovenous fistula of this kind and, together with his own two cases, they were thirteen: three fistulae of the aorta and the inferior vena cava (*Kirklin* 1954, *DeBakey et al.* 1958), three of the common iliac artery and the vena cava (*Linton et al.* 1945, *Glass et al.* 1954, *Mack* 1956) and seven fistulae between the common iliac artery and vein (*Holscher* 1948, *Fortune* 1953, *Harbison* 1954, *Smith et al.* 1957).

As *Horton* points out, it is obvious that it is the present trend, no doubt correct in itself, to remove as much as possible of the degenerated disc tissue, and particularly the method recommended by *Dandy* (1944), for instance, i.e. "complete or essentially complete removal of the affected discs ..." which is, fortunately, probably less frequently employed, which renders such lesions possible. The reports reveal the surprising ease with which rupture of vessels can take place (*Harbison* 1954, *Holscher* 1948).

It has also been shown (*Holscher, Leavens & Bradford* 1953) in some of the cases described that the instrument has injured the vessel through a defect in the annulus fibrosus. But why was there such a defect? It was probably a result of degeneration or perhaps of the disc prolapse itself. Damage to a blood vessel has occurred even when the operation has been carried out by experienced surgeons and despite the fact that particular care has been taken to avoid this complication.

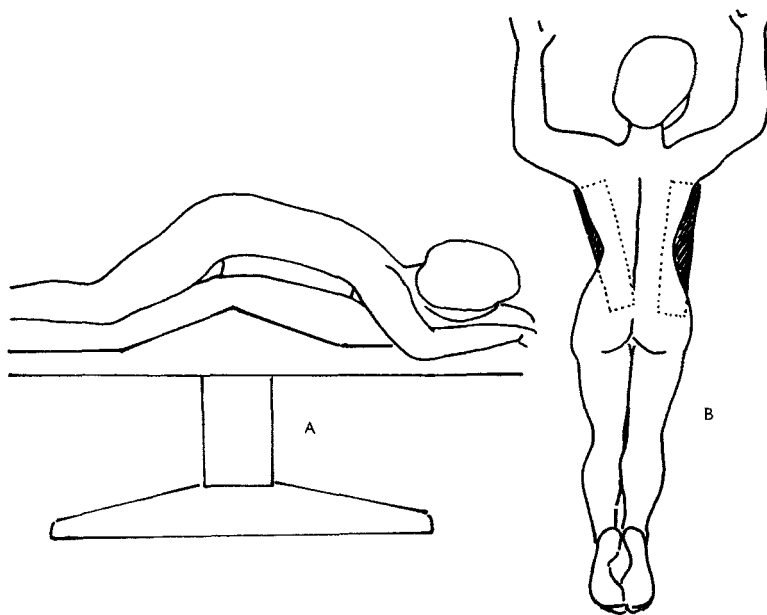


Fig. 1.

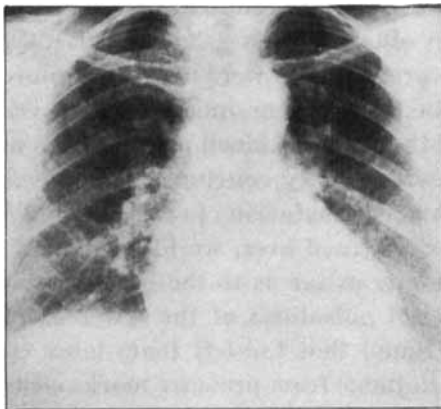
The patient's position on the operating table. The left long cushion displaced.

In the following, a new case will be described in which the operation for a prolapse of a disc was complicated by a fistula between the common iliac artery and vein. Both the operation for the prolapse and that for the fistula were carried out by me.

The patient was a 47-year-old woman who for about six months had suffered from severe sciatica on the right side and in whom prolapse of the disc between the fourth and fifth lumbar vertebrae was diagnosed. The operation was carried out under intubation anaesthesia with the patient in a ventral position. Under the patient on both sides there were, as usual, long narrow latex foam cushions (Fig. 1a) to prevent excessive compression of the abdomen and thorax. From between the fourth and fifth lumbar vertebrae on the right side a disc protrusion under the root of the spinal nerve was excised without bleeding or any other mishap; there were no evident sequestra, nor were such found in the spinal canal. The cavity within the disc, however, was larger than the quantity of nucleus pulposus removed from it would have implied. It was carefully investigated with a blunt probe while the surgeon made a remark to his assistant about the lesions of large vessels reported in the literature! No haemorrhage occurred, nor was there any blood in

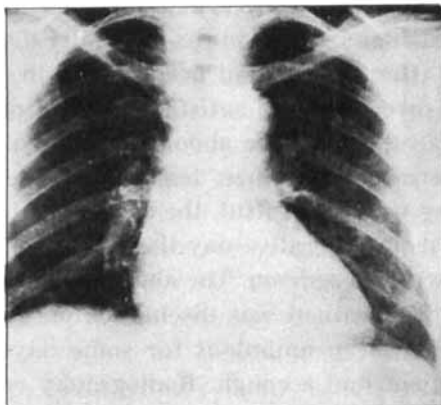
the cavity of the disc. This observation has also been made in connexion with major vessel damage by some other authors (*Glass et al.* 1954, *Seeley et al.* 1954, *Harbison*). While preparations were made to explore, for safety's sake, the disc between the fifth lumbar and first sacral vertebra, the anaesthetist reported that the patient's blood pressure was no longer measurable. The operation was quickly concluded and it was possible only by massive and rapid blood transfusions to raise the blood pressure again. When the patient was turned over, we found that the whole left lower extremity was cyanotic as far as to the inguinal fold and the gluteal region but the arterial pulsations of the lower extremities were symmetrical. We also found that the left foam latex cushion had been placed too medially, to judge from pressure marks clearly observable on the skin (Fig. 1b). Preparations were now made for an abdominal exploration but when the leg had been kept elevated for about half an hour with the aid of cushions, the cyanosis gradually disappeared and remained very mild after the leg had been placed in a horizontal position. The blood pressure remained satisfactory, and on waking the patient did not report any pain in the abdomen or pelvis, nor did palpation reveal any tenderness, resistance, tension or other deviation from the normal. Recovery was uneventful, the symptoms of sciatica disappeared and on the first postoperative day the leg was already warm, normal in colour and without oedema. The abdominal and pelvic organs functioned normally. The patient was discharged on the tenth postoperative day after she had been ambulant for some days. During her stay in hospital the patient had a cough. Radiography revealed slight enlargement of the heart and insignificant pulmonary stasis (no preoperative chest radiograms had been made). Electrocardiography revealed nothing abnormal.

After discharge from the hospital there was rapid development of cardiac insufficiency and pulmonary embolism, the left lower extremity became swollen, the patient's weight increased and her condition remained poor despite intensive medication for the cardiac insufficiency and the pulmonary embolism. Six weeks after the operation for disc prolapse, the patient was seen again by the surgeon and only then was it recognized that her condition was caused by an arteriovenous fistula, obviously between the left common iliac artery and vein. She had pronounced cardiac insufficiency with ascites and pulmonary stasis (Fig. 2a). The left leg and thigh were highly oedematous; above and below the knee the circumference of the extremity was 6 cm. larger than that of the right extremity. A pronounced murmuring thrill was audible and

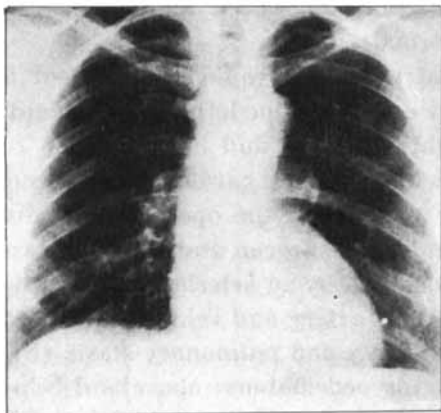
*Fig. 2.*

A. Thorax radiograph ten weeks after operation for prolapsed disc. B. Two weeks after repair of fistula. C. Four weeks after repair of fistula.

A



B



C



Fig. 3.

In an arteriogram made through the right femoral artery the left common iliac artery is not demonstrable.

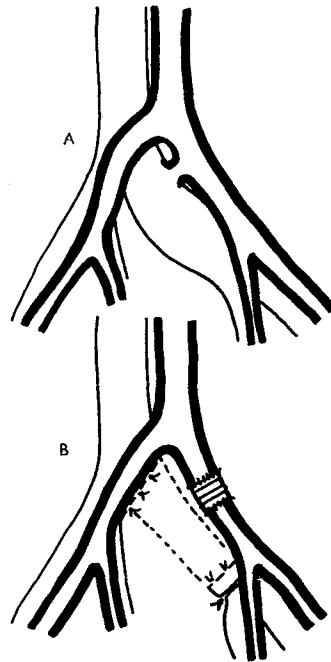


Fig. 4.

A. Schematic representation of the site of the fistula. The right common iliac artery curves over the highly dilated left common iliac vein. B. Schematic representation of the same area at the end of the operation. The left common iliac vein is ligated. In the artery the fistulous area has been substituted with a prosthesis.

perceptible in the lower abdomen caudally of the umbilicus and to the left. Arteriography showed caudally of the umbilicus and to the left. Arteriography showed a fistula between the left common iliac artery and vein (Fig. 3).

2½ months after the operation for disc prolapse, operation for the repair of the fistula was carried out. Through a long left paramedian



Fig. 5.

Photography after closure of the fistula and suture of the prosthesis.

transrectal incision the large retroperineal vessels were exposed. Near the bifurcation a fistula was found between the left common iliac artery and vein. The inferior vena cava and both common iliac arteries and veins were closed with Pott's clamps and a weak heparin solution was injected into the distal arteries. Efforts were then made to free the highly distended common iliac vein. It was so firmly adherent, however, to the underlying tissues, that dissection was impossible. When the fistula was opened it was observed that the venous dilatation contained a thrombous mass and that the wall of the vein was degenerated and rather brittle. The common iliac vein was ligated on both sides of the dilatation. The opening in the artery was so large that direct closure of it, as well as arteriography after resection of the fistulous area, was considered too risky; the fistulous segment was resected (Fig. 4) and the loss was compensated with a Teflon prosthesis about 2 cm. long (Fig. 5). No conclusions as to the mechanism of origin of the fistula could be made.

Recovery was uneventful. Distal arterial pulsations were easily felt immediately after the operation. The cardiac insufficiency was rapidly overcome (Figs. 2b-c). Upon ambulation on the ninth postoperative day, the leg no longer swelled to any noticeable degree and no supporting bandage has since been necessary. The condition of the extremity and back has been good ever since (3½ months after the operation).

CONCLUSIONS

This case constitutes a reminder of the difficulty and even danger of an operation for prolapsed disc. The patient's position on the operating table must be carefully observed. Compression of large vessels must be avoided. Infinite care must be observed in the evacuation and palpation of the disc. Although all degenerated tissue must as far as possible be removed, this must be done with the utmost caution. To use forceps to remove tissue from the bottom of the disc cavity is certainly a most dangerous procedure, particularly in view of the possibility of a defect of the annulus. In operations for disc prolapse one must be prepared for quick and massive blood transfusions.

The cause of such an easily occurring rupture of a vessel must be pathological weakness of the vascular wall, since when these vessels are otherwise manipulated they do not appear to rupture so easily, even in the case here described. It is possible that prolapse of the disc also takes place in a ventral direction, and this, or osteochondrous prominences of the vertebral edges, may cause degeneration or erosion of the vascular wall. There is no doubt that the patient's prone position and the compression of the vessels against the spine facilitate the occurrence of a lesion. It has been established that when a large vessel has perforated and if the haemorrhage and ensuing symptoms do not spontaneously cease at once, immediate exploration and operation are the only means of saving the patient's life. As a rule there is no urgency about the repair of an arteriovenous fistula; in fact, the development of a collateral circulation is an advantage, since ligation of vessels may prove necessary. Cardiac insufficiency and pulmonary embolism, however, necessitate quick closure of the fistula.

SUMMARY

A fistula between the common iliac artery and vein arising at an operation for prolapse of the disc between the fourth and fifth lumbar vertebrae is described. Severe, rapidly exacerbating symptoms necessitated closure of the fistula 2½ months later. The operation was successful.

At operation for prolapse of a disc, the possibility of this rare but serious and easily occurring complication should always be borne in mind.

RESUME

Description d'une fistule entre l'artère et la veine iliaques survenue à la suite de l'opération d'une hernie discale entre la 4ème et la 5ème vertèbre lombaire. Des symptômes graves, devenus rapidement exacerbants, nécessitèrent la fermeture de la fistule, 2 mois et demi plus tard. L'opération réussit.

Dans l'opération de la hernie discale, il convient d'avoir à la mémoire la possibilité de cette complication rare mais grave, qui peut toujours se produire.

ZUSAMMENFASSUNG

Eine Fistel zwischen der A.iliaca communis und Vene, die anlässlich der Operation eines Scheibenprolapses zwischen 4. und 5. Lendenwirbel entstand wird beschrieben. Schwere, rasch sich steigernde Symptome machten eine Schliessung der Fistel 2½ Monate später nötig. Die Operation war erfolgreich.

Bei der Operation wegen Scheibenprolaps sollte immer an die Möglichkeit dieser seltenen, aber ernsthafter und leicht entstehenden Komplikation gedacht werden.

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