Isolated Iliac Artery Aneurysms

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Objective: to assess our experience with isolated iliac artery aneurysms and to assess the blood transfusion requirement in patients undergoing surgery for iliac artery aneurysms.

Material and methods: the case records of 12 patients who underwent 12 arterial reconstructive procedures for isolated iliac aneurysms from January 1989 to December 1995 were identified from our prospective vascular database and reviewed. Only patients with aneurysms limited to the common, external, or internal iliac arteries were included.

Results: eleven patients had symptoms and rupture occurred in five patients. Aneurysmorrhaphy with graft interposition was the most common procedure. There was no perioperative mortality. The median transfusion requirement was 11 units per operation (range 1–30 units). The median intraoperative blood loss was 4700 ml (range 500–13 000 ml).

Conclusions: isolated iliac aneurysm is a dangerous condition. A low perioperative mortality is possible only if large volumes of blood are available.

Introduction

In contrast to abdominal aortic aneurysms and combined aortoiliac artery aneurysms, isolated aneurysms of the iliac artery are uncommon, having an incidence of approximately 0.4–1.9%. However, despite their rarity, several reports have suggested that isolated iliac artery aneurysms have a high risk of rupture with an associated high mortality rate. In a search of the vascular surgery literature, we found few specific recommendations, based on clinical evidence, as to how much blood should be made available for surgery of isolated iliac artery aneurysms. The aim of this study was therefore to assess our experience with isolated iliac artery aneurysms and to assess the blood transfusion requirement in patients undergoing surgery for iliac artery aneurysms.

Material and Methods

The case records of 12 patients who underwent repair of isolated iliac aneurysms from January 1989 to December 1995 at the Department of Vascular Surgery, Rigshospitalet, were identified from the prospective vascular database and reviewed. Only patients with isolated iliac arteries were included. Patients with iliac artery aneurysms associated with abdominal aortic aneurysms were excluded. Information recorded for each patient included age, gender, atherosclerotic risk factors (smoking, hypertension, diabetes mellitus) associated aneurysms, presenting symptoms (rupture, embolism, thrombosis and expansion), duration of symptoms, anatomical location, size of the aneurysms, modality of diagnosis, operative details, postoperative complications and result of operations. All patients underwent routine preoperative and postoperative haemoglobin measurement (in mmol/l, normal range 7.0–10.0 in female and 8.0–11.0 in male). Operative blood loss was assessed by weighing swabs and measuring the drainage volume in the suction apparatus. Suction drains were removed when the amount drained was less than 30 ml per 24 h. In order to put the blood loss during surgery for iliac artery aneurysm in perspective, the blood loss for abdominal aortic surgery is also reported for 100 consecutive operations for ruptured and non-ruptured abdominal aortic aneurysm operation during 1995. Blood saver equipment was not used.

Results

The median age of the 12 patients was 64 years (range 22–78 years). Eight patients were smokers and four
were hypertensive. One had diabetes. Associated aneurysms were identified in two patients: one had a contralateral isolated iliac artery aneurysm, and one had a contralateral femoral aneurysm. No patients had popliteal aneurysms. The most frequent presenting symptom was abdominal pain due to rupture in five cases. Abdominal pain due to an expanding mass occurred in three cases. A genito-urinary disorder was the presenting feature in three cases (hydro-nephrosis in two cases and urosepsis in one case. The average duration of symptoms was 2 weeks (range from 1 day to 8 weeks) and one patient was asymptomatic. The median maximum diameter of the aneurysm (measured at operation) was 7.8 cm (range 4–13 cm). The diagnosis was made clinically in four cases, by ultrasonography in three cases, by angiography in two cases, by CT scanning in six cases and at operation in three cases. In eight cases the aneurysm involved the common iliac artery and in four cases the internal iliac artery.

The most frequent procedure was aneurysmorrhaphy with interposition prosthetic graft in seven cases. Ligation of the internal iliac artery was performed in six cases. A femoral–femoral crossover was performed in one case and an aortobiliac bypass was performed in one case. The complications were one injury to the ureter leading to a urinary fistula, one case of postoperative paresis of the femoral nerve, one postoperative chest infection and one pseudoaneurysm that was successfully treated with an endoluminal stent. The 30-day mortality was nil. One patient died after 6 months for unknown reasons. The median follow-up time was 3 months (range: 1 month–1 year). The median transfusion requirement was 11 units per operation (range 1–30 units). The median intraoperative blood loss was 4700 ml (range <500–13 000 ml). The median preoperative and postoperative haemoglobin was 7.5 mmol/l (range 4.6–9.4) and 7.4 mmol/l (range 6.4–8.4), respectively. In comparison the median blood loss for 100 consecutive abdominal aortic surgery patients was only 3800 ml (range <500–17 000 ml)

Discussion

In 1827, Valentine Mott recorded what is probably the first instance of successful surgical treatment of an aneurysm of the iliac artery. The patient was a 33-year-old farmer who attributed the aneurysm to a blunt injury to the lower abdomen. His suffering was so great that his scream could be heard at a distance from the house! The common iliac artery aneurysm was ligated with preservation of both life and limb. Most aneurysms of the iliac artery occur in association with abdominal aortic aneurysms, either as an extension of the aortic aneurysms onto the common iliac artery or as a separate aneurysm of the iliac artery. However, isolated iliac artery aneurysms are rare. In a review on the location of arterial aneurysms, Silver et al. found 571 patients with abdominal aortic aneurysms, but only 11 patients with isolated aneurysms of the iliac arteries, a relative frequency of 1.9%. Lowry and Kraft reported a similar low frequency of 1.5%. McCready et al. reported a frequency of iliac artery aneurysms not associated with abdominal aneurysms of 0.9%. During the 7-year period of our review the relative frequency was 12/961 (1.25%). By combining autopsy records and operating records, Brunkwall et al. found a total of 13 cases of solitary iliac artery aneurysms during a 15-year period in Malmo, Sweden (population 230,000). It is generally agreed that the most common cause of isolated iliac artery aneurysms is atherosclerosis. However, they may be congenital, and there have been a number of case reports of iliac artery aneurysms during pregnancy, in association with syphilis, tuberculosis, osteomyelitis, Behcet disease, cystic medial necrosis and hyperhomocystenaemia. The majority present in men in their seventh decade. In a review of the literature Schuler and Flanigan collected the data for 69 patients with isolated aneurysms of the iliac artery. The mean age was 69 years and 88% were men. Eighty-nine per cent of isolated iliac artery aneurysms are located in the common iliac artery, 10% in the internal iliac artery, and only 1% in the external iliac artery.

Iliac artery aneurysms often escape detection, probably largely because of their inaccessible position within the pelvis, and the relative rarity of these aneurysms contributes to a low index of suspicion when confronted by chronic lower abdominal or pelvic symptoms or an overt vascular emergency. Symptoms resulting from pressure on adjacent structures, such as bowel, bladder, ureters, nerve roots and pelvic veins, can produce diagnostic confusion, especially in the absence of an obvious mass. Renal colic, sciatic nerve root pain, haematochezia and haematuria, reflect the erosive and compressive nature of these aneurysms. As a consequence, isolated iliac artery aneurysms are often large when diagnosed. Schuler and Flanigan reported an average size of 8.5 cm. Lowry and Kraft reported a similar size of 7.5 cm. McCready et al. reported a size 4.5 cm for asymptomatic and 7.8 cm for symptomatic aneurysms; they also report an average increase in aneurysmal diameter of 4 mm per year. Bolin et al. reported a size of 4.5 cm for nonruptured aneurysms and 6.0 for ruptured aneurysms.
ysms. The rate of rupture seems to vary from 14% to 75%. A plain X-ray may show a curvilinear calcification. Abdominal duplex ultrasound, CT scanning, arteriography and MRI are all useful means of definitive diagnosis.

Operative treatment is indicated since the natural course is one of progressive expansion and rupture. It has been recommended that all iliac aneurysms over 3 cm should be repaired, although rupture of aneurysms of less than 4 cm is uncommon. The mortality rates for elective and emergency surgery range from 0–33% and 0–75%, respectively.

In a large series of 53 isolated iliac aneurysms, Nachbur et al. reports a 20% (three out of 15) operative mortality for ruptured isolated iliac aneurysms and nil (0 out of 38) for elective resections. Aneurysmorrhaphy with graft interposition is the treatment of choice for aneurysms of the common and external iliac arteries. Small aneurysms of the internal iliac artery can be ligated, but larger aneurysms should be opened, decompressed, and obliterated (endoaneurysmorrhaphy) to prevent compression of adjacent structures. Aortofemoral bypass grafting with exclusion of the aneurysm has been reported as a reasonable alternative in the treatment of iliac artery aneurysms. The colorectal circulation may be impaired when both internal iliac arteries are ligated. Therefore, reconstruction of one of the internal iliac arteries should be considered in these cases. More recently, percutaneous endovascular repair has been reported as a safe and efficacious treatment of iliac artery aneurysms. The use of autotransfusion by preoperatively collecting the patient’s blood, or by using a cell saver device may help to decrease the transfusion requirements of this operation. It may be wise to refer patients requiring elective surgery to a major vascular centre.

References


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