SURGICAL TREATMENT OF A RUPTURED GIANT RENAL ARTERY ANEURYSM – CASE REPORT AND LITERATURE REVIEW

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Renal artery aneurysms are the second most common visceral artery aneurysms after splenic artery aneurysms, and before hepatic artery aneurysms. The study presented a case of a ruptured giant right renal artery aneurysm in a female patient. The presented case is worth mentioning, due to the giant size of the lesion. The diameter of the aneurysm exceeded 10 cm. Available literature data mentioned single reports of such large aneurysms located in the renal arteries. In spite of the fact that renal artery aneurysms are the second most common visceral artery aneurysms, their management is accompanied by some controversy. Literature data mentioned the dominance of endovascular techniques. However, surgical treatment remains to be the most effective and radical method.

Key words: renal artery aneurysm, diagnostics, surgical treatment

Renal artery aneurysms are diagnosed in 0.015% to 1% of the general population (1, 2). In case of one study, renal artery aneurysms were diagnosed in 7 of 965 patients (0.73%), while in another in 83 of 852 patients (0.97%) subject too arteriography (3). The renal artery aneurysm is the second most common visceral artery aneurysm after splenic artery aneurysm and before common hepatic artery aneurysm (4, 5).

The study presented a case of a female patient diagnosed with a ruptured giant right renal artery aneurysm. The case is worth mentioning, due to the size of the lesion. The diameter of the aneurysm exceeded 10 cm. Literature data mentioned single cases of aneurysms located in the renal arteries (6, 7). Physicians from the university hospital in Atlanta reported 28 cases of renal artery aneurysms, size ranging between 0.5 cm and 8 cm (average diameter: 2.1 cm) during the period between 1972 and 1992 (8). Reports from Japan mentioned 485 cases of renal artery aneurysms diagnosed before 2006. However, only 15 measured more than 5 cm (9).

CASE REPORT

An 87-year old female patient (E.S., case record 11052, ID 12549) with symptoms of oligovolemic shock was admitted to the Department of General and Vascular Surgery, Regional Hospital in Rybnik during emergency surgery. The patient had a history of a right renal aneurysm diagnosed several years earlier, disqualified from surgical intervention, due to lack of patient consent and arterial hypertension. The day before admission the patient complained of right lumbar region pain and hematuria. On admission, the patient complained of right lumbar and sacral pain. The physical examination showed local muscular defense of the right abdomen, and a pulsating tumor in the right epigastrium. Abdominal ultrasound showed local mus-
peritoneal space hematoma was also observed. The described lesion was diagnosed as a ruptured right renal artery aneurysm (fig. 1).

The patient underwent emergency surgery under general anesthesia. The midline incision was performed reaching the lesion by means of the retroperitoneal approach. Intraoperatively, a ruptured right renal artery aneurysm was diagnosed involving the renal parenchyma. The lesion nearly completely destroyed the right renal parenchyma (fig. 2a-e). A giant hematoma filled the retroperitoneal space. Due to the size of the lesion and renal destruction the patient was subject to nephrectomy (fig. 2).

The operative course was uneventful; the patients’ general condition was stable. After the operation the patient was transferred to the Intensive Care Unit, Regional Specialistic Hospital in Rybnik. Directly after the operation the patient was intubated, subject to controlled mechanical respiration, and received suppressor amines. On the first postoperative day the patient was extubated, with normal respiration restored, in full contact, respiration and circulation were stable. On the second postoperative day the patients’ clinical condition improved, oral nutrition was introduced. On the fourth postoperative day the patients’ condition deteriorated, bilateral pneumonia was diagnosed requiring intensive pharmacological treatment. During the next three days the patient developed respiratory and circulatory insufficiency without improvement, in spite of intensive therapy. The patient died on the seventh postoperative day, due to respiratory and circulatory failure. The intraoperative histopathological examination result was as follows: atheromatosis et atherosclerosis parietis arteriae cum calcioficationibus. Imbibiitio haemorrhagica renis. Pyelonephritis chronica.

**DISCUSSION**

According to literature data mortality in case of patients with intrarenal aneurysms during the initial 30 days after surgical treatment amounted to 4.7%, while in case of pararenal aneurysms – 2.9% (10).

Renal artery aneurysms are often of unknown etiology (12). According to many authors, 60-70% of renal artery aneurysms develop as a consequence of the atrophy of arterial elastic fibers. Atherosclerosis is responsible for the development of 30-40% of aneurysms, while inflammation- 1-2% (12, 13). Renal artery aneurysms may be divided into the following: saccular aneurysms, due to atherosclerosis located in the hilum of the kidney, usually diagnosed in the sixth decade of life; fusiform aneurysms-accompanying fibromuscular dysplasia in patients with arterial hypertension; dissecting aneurysms which are rarely diagnosed-fibromuscular dysplasia or atherosclerosis are considered as etiological factors, as well as trauma, accompanied by pain, hypertension, hematuria, and microaneurysms of the renal arteries. The latter are most often observed in patients diagnosed with vasculitis (2, 14, 15).
Renal artery aneurysms are often diagnosed accidentally on the basis of urological symptoms, which is evidence of severe complications. Currently, the renal artery aneurysm is diagnosed on the basis of color doppler ultrasonography, magnetic resonance angiography, spiral CT angiography, or digital subtraction angiography (2). It seems that digital subtraction angiography is the method of choice, considering future management (16, 17).

The presented study case could not be qualified to one of the above-mentioned aneurysms, since its wall saturated calcium salts, being accompanied by pain, hematuria, arterial hypertension, and nearly complete destruction of the renal parenchyma.

The therapeutic method used in case of an asymptomatic renal artery aneurysm depends on the size of the lesion. Aneurysms <2 cm in size only require observation. In case of nephrogenic hypertension, presence of urological symptoms, dissection, embolism, local compression, reproductive age and pregnant women, surgical or intravascular management are recommended. Surgical management consists in the excision of the renal aneurysm and in vivo or ex vivo reconstruction of the renal artery, as well as autogenic graft of the kidney. The above-mentioned is considered as a safe and effective therapeutic method, considering the management of renal artery aneurysms. Intravascular procedures consider the use of a peripheral stent-graft or DIC of the lesion with maintained renal perfusion. However, in selected cases partial or complete nephrectomy are required, due to the size of the lesion, its location and possible complications such as aneurysm rupture. The first described operation of the renal vessels with maintained renal function consisted in the excision of the renal artery aneurysm (2, 3, 12, 17, 18).

During the era of minimally invasive techniques endovascular treatment is considered as a safe and effective method, as compared to classical surgery. Patient satisfaction is rapidly observed in addition to a good distant therapeutic effect (19-22). Considering the presented case the retroperitoneal approach was used, as to better reach the renal artery branching off the aorta, and the need to perform a nephrectomy (23).

In spite of the fact that renal artery aneurysms are the second most common visceral artery aneurysms, their therapy is accompanied by controversy. Literature review presented the dominance of endovascular techniques. However, surgical treatment remains the most effective and only radical therapeutic method.

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