SHORT REPORT

Pelvic Kidney and Aorto-iliac Aneurysm—A Rare Association—Case Report and Literature Review

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Association of a congenital pelvic kidney with abdominal aortic aneurysm is rare and to date only a handful cases have been reported in literature. We report one such case, which was successfully treated using the technique of temporary extra-anatomical perfusion of the kidney.

Keywords: Abdominal aortic aneurysm; Congenital; Pelvic kidney; Javid shunt; Extra-anatomical.

Association of abdominal aortic aneurysm with congenital pelvic kidney is rare. The technical challenge is in preserving the function of the pelvic kidney. A variety of methods have been adopted to minimise the ischaemic insult to the pelvic kidney during repair of the aneurysm. We report a case of successful repair of an aorto-iliac aneurysm with congenital pelvic kidney with very minimal ischaemic time, along with review of the literature.

Report

A 69-year-old Caucasian male was referred with an aorto-iliac aneurysm. The maximum diameter of the aorta and right common iliac artery were 54 and 52 mm, respectively. The patient had undergone a sigmoid colectomy 16 years previously and was noted to have a right-sided pelvic kidney during that operation. The renal function tests were within normal limits. The CT scan and transfemoral angiography (Fig. 1) revealed that the right renal artery originated from the proximal right common iliac artery. DMSA scintigraphy showed that the right kidney contributed to 24% of the total renal function, but these findings are influenced by the position of the kidney within the pelvis.

At laparotomy a 2 cm long renal artery arising from the right common iliac artery was noted to perfuse the pelvic kidney. One end of a 10 mm dacron graft was anastomosed to the right axillary artery, and a Javid™ (IMPRA Inc., USA) shunt secured to its other end. A 9 mm dacron graft was anastomosed to the main body of an 18x9 mm² bifurcated dacron graft to create a third limb of graft, to perfuse the pelvic kidney.

After systemic heparinisation and cross clamping, the aneurysm was opened and the right renal artery detached from the iliac artery with a cuff of the aneurysmal wall. The pelvic kidney was perfused by cannulating this renal artery with the free end of the Javid shunt (Fig. 2), thus markedly minimising ischaemia to the kidney. Following anastomosis of the graft to the infrarenal aorta, the pelvic kidney was revascularised by anastomosing the renal artery to the third limb of the graft. The Javid shunt was removed just prior to placing a final few sutures of the anastomoses. The repair of the aneurysm was completed by anastomosing the left limb of the trouser graft to the left common iliac artery, and the right limb of the graft to the right common femoral artery, after ligating the origins of the internal and external iliac arteries. The axillary artery was repaired after removing the graft. The patient had a transient rise in blood urea and creatinine that settled quickly without any need for renal replacement therapy.

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Discussion

Congenital pelvic kidney results from failure of embryological kidney to ascend during 4th–8th weeks of gestation. It is associated with a short ureter, entering the bladder on the same side as the kidney.

The arterial supply can arise from distal aorta, common or external iliac arteries. Non-invasive preoperative assessment of the function of a pelvic kidney does not give an accurate estimate of its physiological capacity. With the gamma camera placed posteriorly, the function is underestimated because of the intervening ischium and the increased distance between the pelvic kidney and the camera. Whilst some correction can be achieved by placing the gamma camera anteriorly, the estimation of the renal function of a pelvic kidney is imprecise.

A variety of techniques has been described to limit the ischaemic damage to such abnormally pelvic kidneys. Proximal double clamping of the neck of aneurysm can be used if the aneurysm is entirely limited to the aorta. This technique does not render the kidney totally ischaemic as the kidney is perfused by retrograde flow in the iliac and the lumbar arteries. When the perfusion of the kidney is completely eliminated, then either perfusion of the kidney with cold solution or surrounding it with ice packs reduces its metabolism, thereby minimising damage. Using this technique the kidney needs to be reperfused after about 40–45 min of cold ischaemia to avoid any damage, leaving very little room for manoeuvre when there are unexpected difficulties in the proximal anastomosis. Conventional repair with administration of frusemide and/or mannitol before cross clamping has also been described. The main disadvantage with these techniques is that one has to race against time to perfuse the kidney, and the ischaemic insult will result in severe impairment to the kidney whose function is previously compromised. Perfusion with aid of a pump oxygenator eliminates this disadvantage but requires the availability of the equipment and a technician to operate this. The technique we have utilised is simple and effective. This technique needs to be tested in a proper randomised trial before being recommended as first choice in similar situations.

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References


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