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Case Reports

CELIAC ARTERY ANEURYSM; A NEW METHOD IN THE MANAGEMENT OF AN OLD PROBLEM

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ABSTRACT

Celiac artery aneurysm is a rare visceral aneurysm, comparising only 4% of them. In this article, an innovative surgical method is presented for the treatment of such aneurysms.

A 53 year old female referred to our center with epigastric pain and a mass in the region, which was diagnosed as a case of celiac artery aneurysm by using different imaging techniques. During the operation, according to the firm adherence of the mass to the aorta and a short celiac artery stump, we omitted aortic clamping and took control of entrance and exit sites to the aneurysm using a Foley and a Fogarthy catheter respectively. Using the normal part of the aneurysm's wall, the damaged part was trimmed and patched with a PTFE vascular patch.

The patient was discharged satisfactorily in two days and did not have any problem in her follow-up. There was no need for extracorporeal oxygenation and total time of the procedure and vascularization was shortened.

This surgical method obviates extracorporeal oxygenation due to reduction of aortic clamping time. Total procedure time and revascularization time will be shortened. It is proposed as an alternate method in cases when a short stump restricts proximal clamping, and also since there is little risk of renal and visceral ischemia.

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Keywords: Celiac artery, Visceral aneurysm, Clamping time, PTFE patch repair.

INTRODUCTION

Celiac artery aneurysm is considered as a rare condition comprising 4% of all visceral artery aneurysms which stands in the 4th place after splenic artery (60%), hepatic (20%) and superior mesenteric artery aneurysms (5%).[1] Although the disease is not common, as the possibility of spontaneous rupture of these aneurysms is 10%-20% and is accompanied by a mortality rate of 20%-70%, the therapeutic aspects require specific attention.[2] Using recent diagnostic methods, the chance of detecting patients electively before aneurysmal rupture has increased to 70% from the previous rate of 20%. Therefore, selecting the appropriate therapeutic method in these patients has become more significant.

Several surgical methods have been suggested as

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remedies for treating these patients such as ligating the artery on both sides of the aneurysm and resection with or without revascularization; revascularization methods include end-to-end anastomosis or interposition using a synthetic graft or autogenous saphenous vein to maintain the circulation.[•] But, there always remain problems in selecting an appropriate method while approaching these cases surgically.

In this paper, a new method for the surgery is going to be explained.

CASE REPORT

The patient was a 53-year-old female who presented to our hospital with epigastric pain of 5-years duration in September 2002. She noted that she has had epigastric pain radiating to her back. The pain was not related to eating and was occasionally associated with a pulsatile mass in the abdomen. There was a history of hypothyroidism and levothyroxine ingestion (euthyroid on admission). She also used to receive NSAIDs and corticosteroids because of DJD. There was no positive family history for vascular diseases.

On physical examination, the vital signs were normal. The abdomen showed generalized obesity and the only positive sign in her physical examination was mild tenderness besides an ill defined mass on deep palpation of the epigastric region.

The findings of lab data were unremarkable. In abdominal sonography and then CT scan, a mass 5.5 cm in diameter was detected in the upper abdomen and due to the possible vascular origin, angiography was suggested (Fig.1).

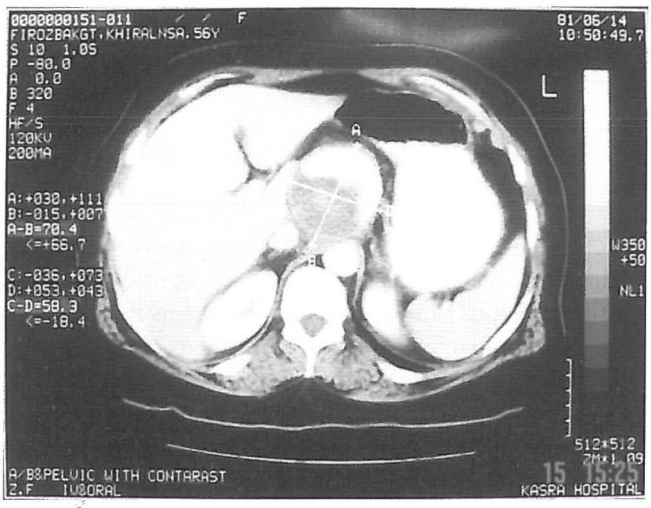

Fig. 1. CT scan showing a 5.5 cm round mass in the upper part of the abdomen.

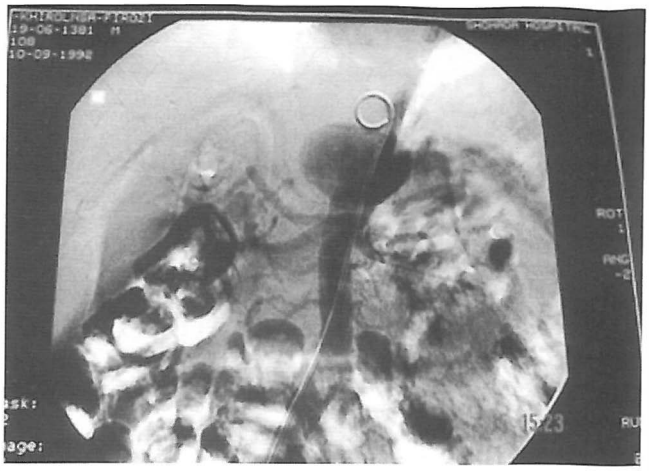

Fig. 2. Angiography showing a vascular mass in the origin of the celiac artery.

In angiography, a fusiform dilatation was seen in the origin of the celiac artery immediately after its takeoff from the aorta and before its bifurcation. A thrombus was observed inside the aneurysm, but the celiac branches were normal (Fig. 2).

She underwent surgery after preoperative preparation. During surgery it was noticed that the celiac artery was aneurysmal in a short distance after separation from the aorta. Using a retroperitoneal approach we mobilized the spleen, pancreas, and colon medially and we obtained control of the aorta, the hepatic and the splenic arteries.

Because of the large size of the aneurysm, its severe adherence to surrounding tissues, and short distance from the aorta, repair was impossible through resection and primary anastomosis such as using saphenous vein or a synthetic graft. Therefore, after opening the aneurysm, the entrance and exit arteries were defined. Bleeding of the celiac artery and back –bleeding of the splenic and hepatic arteries were stopped by placing a n.8 Foley catheter and a n.5 Fogarthy catheter in the entrance and exit arteries and inflating their balloons respectively. Using this method of control, there is no need to dissect these arteries, which is a considerable task because of adhesions around the aneurysm. The aortic clamp was then removed to decrease the ischemic time of the kidneys and other visceral organs (Fig. 3).

Since the mentioned clamping time is approximately 2-3 minutes, it obviates the need for extracorporeal oxygenation to perfuse the kidneys.

Then, by using a part of normal aneurysmal wall to which the entrance and exit arteries were attached, a piece of PTFE graft -1.5 × 2 cm in size -was sewn to the defect by continuous 4 – 0 prolene sutures. By the end

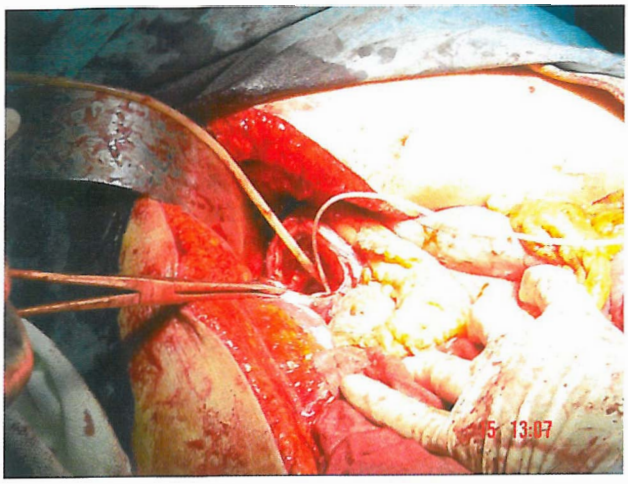

Fig. 3. Bleeding of the celiac axis and back–bleeding from the splenic and hepatic arteries were controlled by means of placing a no. 8 Foley catheter and a no. 5 Fogarthy catheter in the entrance and exit arteries respectively and inflating their balloons.

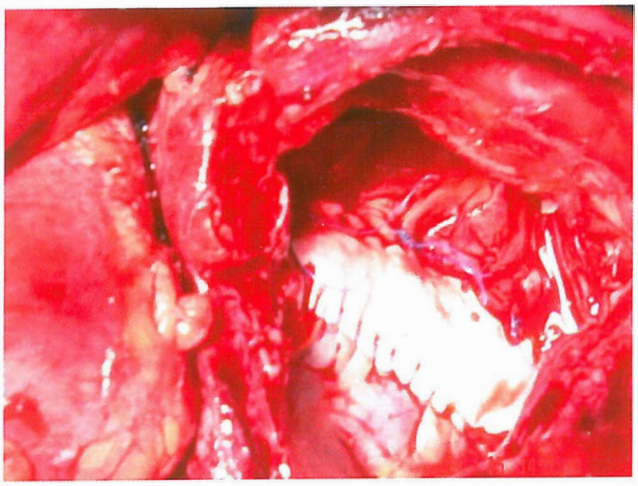

Fig. 4. A piece of PTFE graft was sewn to the defect using continuous, 4–0 Prolene sutures.

of the procedure, the Foley and Fogarthy catheters were deflated and extracted from the orifices and the prolene suture was tied (Fig. 4).

Blood flow was maintained in the splenic and hepatic arteries. Excess aneurysmal wall was trimmed and the remaining part was sewn over the PTFE graft. The patient received 3 liters of crystalloids and one unit of blood during the operation. The surgery finished in 2 hours.

DISCUSSION

The rare disease of celiac artery aneurysm contains confined related reports in the medical literature. Only 108 cases had been reported up to 1985. In recent years, on the ground of progressive imaging techniques, the problem can be diagnosed more frequently and also its etiology and rupture rate have changed.[2] Concomitant aortic aneurysms were seen in 18%, while other visceral arterial aneurysms were existent in 38% of the cases synchronously with the celiac artery aneurysm. No sex preference and no increase in rupture risk in pregnant women have been mentioned. The mean age has been 40 years before 1960 but has increased to 52 recently.[3,4,5] Up to 1999, only 69 articles were available discussing the surgical treatment of these patients in international journals.[6,7]

Based on the high mortality rate of aneurysmal rupture and the low risk of surgery, in all cases with acceptable surgical risk, surgery is highly recommended. There has been no relation between factors such as calcification, size of the aneurysm, gender and intraaneurysmal thrombus and the risk of aneurysmal rupture. In some reports, cases of percutaneous aneurysmal embolization have been introduced.[8]

In emergency cases of aneurysmal rupture, immediate surgical intervention is required to save the patient's life. In such condition, the aneurysm should be ligated and the risk of possible visceral ischemia is acceptable. It has been shown that this method is well – tolerated and liver, spleen, and intestinal ischemia have not been commonly observed. There are controversies over selecting patients who should undergo elective operation. Some references indicate surgery for all patients whereas others restrict it to aneurysms larger then 2 cm.[2] The high mortality rate (40%) associated with rupture is the main reason for advocating surgery. Nowadays, the surgical risk for elective patients has become trivial (5%).

Several methods have been proposed for the purpose of reconstruction of the artery. It is possible to anastomose the two ends of the artery after aneurysmal resection (of course on condition of having a normal proximal celiac artery of proper length)[1]. If primary anastomosis is not feasible, aortoceliac bypass from the supraceliac aorta using a synthetic graft or an autogenous vein, is preferable. The patency rate of PTFE grafts have been more than saphenous veins.

We used another method to manage our patient, which has been reported less frequently.[9] In this method, a piece of PTFE graft was used to replace the degenerated part of the aneurysmal wall. Furthermore, the normal part between the entrance and exit arteries was used in a way to keep the entrance and exit arteries of the aneurysm intact. By this method, revascularization of the arteries distal to the aneurysm was fulfilled and the main part of the aneurysm wall was resected. Also, after clamping the aorta, the aneurysmal wall was opened and by placing a no. 8 Foley catheter and a no. 5 Fogarthy catheter in entrance and exit sites respectively and in-

flating the balloons the bleeding was controlled. The aortic clamp was removed and the ischemic time of the viscera and the kidneys was minimized (1-2 min) precluding the need for extracorporeal oxygenation to supply flow to the kidneys and mesenteric artery. The shortened time of the procedure and minimum bleeding were the other positive aspects. The patient was followed for 2 years and did not have any specific problem during this follow up period.

CONCLUSION

This surgical method obviates extracorporeal oxygenation due to reduction of the aortic clamping time. Total procedure time and revascularization time will be shortened. It is proposed as an alternate method in cases when a short stump restricts proximal clamping, in order to reduce the risk of renal and visceral ischemia.

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