

Hepatorenal bypass using autogenous, free internal iliac artery graft: An attractive alternative to revascularize the right kidney in Takayasu's disease

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ABSTRACT

Nonspecific aortoarteritis or Takayasu's disease (TD) is a chronic pan endarteritis of unknown origin involving the aorta and its major branches affecting young adults especially women. The disease is more common in eastern Asian countries. Hypertension in these patients generally reflects as renal artery stenosis, which is seen in 28–75% of patients. Surgical revascularization is occasionally needed in patients with failed medical management or endovascular interventions. We report two cases of Takayasu's arteritis in young women where renal revascularization was done using free internal iliac artery hepatorenal bypass graft with excellent control of hypertension in the postoperative period.

Key words: Takayasu's disease, hepatorenal bypass, hypogastric artery

INTRODUCTION

Takayasu's disease (TD) is a chronic pan endarteritis, involving the aorta and its major branches affecting young adults especially women. The disease is more common in Asia. Type 1 (cranial vessels) and type 2 (aortic arch) disease are common in Japan, whereas types 3 (abdominal aorta) and 4 (diffuse vessel involvement) are common in India. In India, TD accounts for almost 60% of cases of renal artery stenosis (RAS).^[1] Hypertension occurs in approximately 50% of patients. Steroids are the mainstay of treatment. Renal artery (RA) involvement is best treated by percutaneous transluminal angioplasty (PTA). Surgical revascularization is indicated in cases of failed PTA. We report two cases of TD in young women managed successfully using autologous internal iliac artery (IIA) hepatorenal bypass graft.

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CASE REPORTS

Case 1

A female aged 32 years presented with uncontrolled hypertension on four drugs for 5 years. She also had a history of recurrent spontaneous abortions. She had been treated for TD with steroids. Her blood pressure in both arms was 180/116 mm Hg. Abdominal examination revealed a bruit in the umbilical region. Her serum creatinine was 1.6 mg/dl, erythrocyte sedimentation rate (ESR) 18 mm/h (Wintrobe's), C-reactive protein (CRP) 4.2 mg/dl, normal hepatic functions, and a negative lupus anticoagulant. Computerized tomography (CT) scan of the abdomen showed a left kidney of 7.5 cm with poor contrast uptake, while the right kidney was 10 cm with good contrast uptake. An isotope renal diethylene triamine penta acetic acid (DTPA) scan showed global glomerular filtration rate to be 40 ml/min and differential function right: left::80%: 20%. Angiogram showed bilateral RAS (right 50% and left 90%), fusiform dilatation of abdominal aorta in infrarenal region, and early branching of the right RA [Figure 1a]. Because of unfavorable morphology of aortoiliac region, endovascular therapy was not attempted and surgical revascularization of the right kidney was planned. The patient was not put on any steroids as her inflammatory markers were normal. On exploration, right RA was normal distally. Hepatic artery and gastroduodenal artery were exposed. A free IIA graft was taken along with origins of both anterior and posterior divisions (Y-graft) as conduit. The hepatic artery was occluded and the gastroduodenal artery was ligated and

divided at its origin. The ostium was enlarged and the Y-graft was sutured end to side with the hepatic artery and end to end with both the RA branches [Figure 1b]. The anastomosis time was 9 min and no perioperative cooling was used. The right kidney was well-vascularized on a postoperative angiogram [Figure 1c]. Her serum creatinine was 1.4 mg/dl. She is being followed up now for last 2 years and on a single antihypertensive with normal blood pressure.

Case 2

A 26-year-old female presented with a history of intermittent throbbing headache and four previous spontaneous abortions. She was a known hypertensive for 7 years on four antihypertensive drugs. On examination, the pulses in the left arm were feeble. Blood pressure was 170/110 mmHg in the right arm and 158/70 mmHg in the left. There was no palpable bruit. On investigations, the creatinine was 0.8 mg/dl. Liver function tests and the lipid profile were normal. ESR was 20 mm/h, CRP was 4 mg/dl, and lupus anticoagulant was negative. On ultrasound, the right and left kidneys measured 8 and 11 cm, respectively. An isotope renal DTPA scan revealed 32% function on the right side. Angiography revealed left subclavian stenosis, narrowed abdominal aorta with dilated thoracic aorta, stenosis with beaded appearance of right RA at the origin, and a normal left RA [Figure 2a]. The celiac axis, hepatic trunk, and the gastroduodenal artery were normal. A diagnosis of TD was made and she was started on steroids. Once her inflammatory markers were normal, PTA was attempted but was unsuccessful. The patient was taken up for hepatorenal bypass using IIA free graft. In this case as there was no early branching, the free graft was a tubular conduit [Figure 2b]. The rest of the procedure was similar and the anastomosis was completed in 8 min. Postoperatively, at 3 months the patient is controlled on just one antihypertensive and her serum creatinine is 0.8 mg/dl.

DISCUSSION

Seventeen percent of patients with TD require surgical revascularization.^[2] Operative intervention should preferably be delayed till a period of quiescence is achieved on steroids and the markers of active disease (ESR and C-reactive protein) are within normal limits as such interventions carry more chances of graft thrombosis and revision.^[2] The surgical options include aortorenal bypass using saphenous vein or polytetrafluoroethylene (PTFE) graft, iliorenal bypass, aortic replacement graft-renal bypass.^[3] Splenorenal bypass, renal autotransplantation using either direct or indirect reimplant, meandering collateral from inferior mesenteric arterial system,^[4] or hepatorenal bypass.

We chose hepatorenal extra-anatomic bypass with internal iliac graft for renal revascularization as celiac axis is rarely involved in TD and the use of IIA as free graft has additional advantage of being able to tackle branches (as in

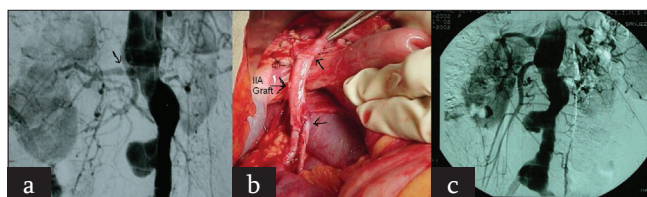


Figure 1: (a) Angiogram showing right renal artery stenosis. (b) Intraoperative photograph showing internal iliac artery anastomosed to hepatic artery and renal arteries. (c) Postoperative angiogram showing revascularized right kidney.

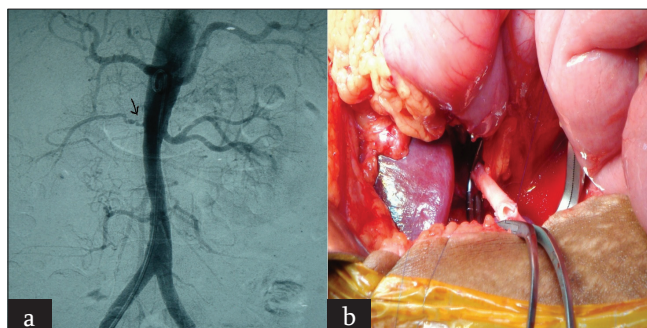


Figure 2: (a) Preoperative angiogram showing right renal artery stenosis. (b) Intraoperative photograph showing tubular IIA graft anastomosed to the hepatic artery.

our second case) or accessory RA requiring fewer number of anastomoses, as compared to prosthetic or saphenous vein graft. A good hepatic function is to be ensured before surgery.

As the disease frequently affects young women, obstetric complications are a common mode of presentation as in both of our patients. Maternal complications reported include superimposed pre-eclampsia, congestive cardiac failure, and progressive renal impairment. Abdominal aortic involvement and a delay in seeking medical attention are predictors of a poor perinatal outcome.^[5] Almost all maternal and fetal complications result from uncontrolled blood pressure and outcomes can be improved with renal revascularization.

Postoperatively, the patients are kept on steroids and occasionally on cytotoxic drugs as the disease is believed to have an immunologic origin. They need careful follow-up because of incidences of restenosis and disease making appearance at new sites especially in cases operated in active phase of disease.^[2] Long-term disease survival is excellent.

In conclusion, hepatorenal bypass using free IIA graft is an effective tool for renal revascularization in selected cases of TD.

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