

Aortobifemoral Bypass Grafting a Gold Standard in Chronic Aortoiliac Disease

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I. Introduction

Aortobifemoral bypass is a procedure done commonly for a disease called Aortoiliac disease. This disease is common especially in a developing country like India where poor socioeconomic status, illiteracy, lack of awareness among people about the consequences of smoking and poverty leading to lack of proper treatment well in time is common. Aortoiliac disease is a type of peripheral artery disease. Aortoiliac disease is the second most common subset of peripheral arterial disease next to infra-inguinal femoral artery disease involving an atheromatous occlusion of the infra renal aorta, common iliac arteries or both¹.

Mostly the underlying pathology is atherosclerosis. Many risk factors are involved like smoking, HTN, diabetes, dyslipidaemia, obesity, socioeconomic status out of which Smoking is a strong and independent predictor of the peripheral artery disease across populations². diabetes is also an important risk factor seen with two fold increase in the disease incidence².

Patients presents with complaints intermittent claudication starting from hip, buttocks, thigh and calf muscles. In Aortoiliac disease intermittent claudication is more in hips, buttocks, thigh. Calf is involved mostly in distal disease³. patient may have rest pain and gangrene if there is chronic occlusive disease distally.

Ct angiogram is one of the best non-invasive modality to diagnose the disease and to locate the level of block for appropriate surgery¹. As patients are old age suffering from atherosclerosis so careful history for cardiac symptoms is important to look for and if present coronary angiogram should also be considered to rule out coronary artery disease.

Aortobifemoral bypass is the gold standard technique for chronic occlusive disease although it has some complications like infection, bleeding, anastomotic aneurysm and this is the purpose of this paper to review the incidence of preceding arterial surgery and the complications of the surgery and we deal with.

II. Materials And Methods

The study was done at our centre Swai Man Singh medical college, Jaipur, Rajasthan. we took 50 patients operated in the period of august 2016 to august 2018 of age between 40 years to 80 years. the patients took for study were having exclusively infra renal blocks. all patients had intermittent claudication mostly involving hip, buttocks, thigh. Very few had calf muscle involved. polyester grafts were used of dimension 7x14x50cm. Both males and females were taken although we had only one female. Thorough investigation was done including all blood investigations, CT angiogram both for coronary and aorta. proper consent form was signed by the patients and the attendants for approval of surgery with explained risks. Patients included had ABI to be less than 0.9.

III. Operative Technique

General anaesthesia was used and surgery was performed with midline abdominal incision and simultaneous incisions at both femoral sites. Meticulously infra renal abdominal aorta and bilateral femoral arteries were looped with vascular loops. Partial clamping of the aorta was done and Fogarty catheter was passed proximally and distally after arteriotomy vertically after good flow proximal anastomosis end to side was done with polyester graft with proline 5.0 except for 1 case in which we found a saccular aneurysm on right iliac artery and we underwent end to end anastomosis. Aortic clamp released and the distal anastomosis with 6.0 proline was done end to side at the level of profunda femoris junction after achieving good backflow by passing Fogarty catheter no 5 in femoral artery distally and proximally. All anastomotic sites were checked for haemostasis thoroughly. Some patients needed femoro-popliteal grafting which was performed in same sitting with saphenous vein graft. All incisions were closed in layers and patients were shifted to I.c.u on Ambu bag.

IV. Results

The mean age of our patients was 59.26 years out of which 10 patients were between 40 years to 50 years of age (20%), 16 patients was between 51 years to 60 years of age (32%), 21 patients was in the age of 61 years to 70 years of age (42%), 3 patients was between 71 years to 80 years of age (6%) as seen in fig 1.

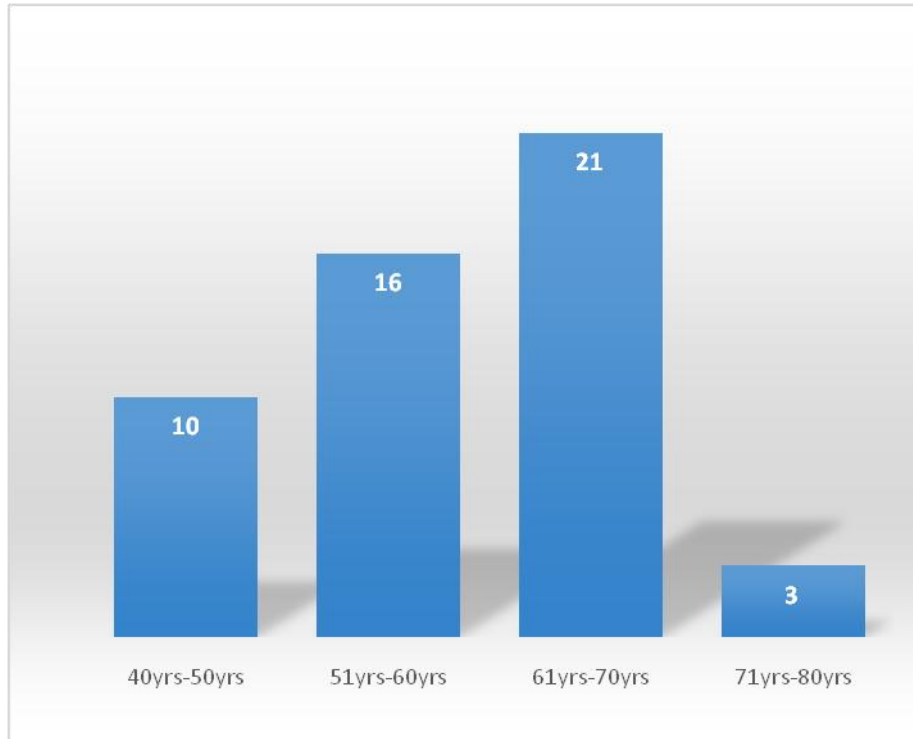


Figure 1: age of patients

We had 49 males (98%) and 1 female (2 %) in our study as seen in fig 2.

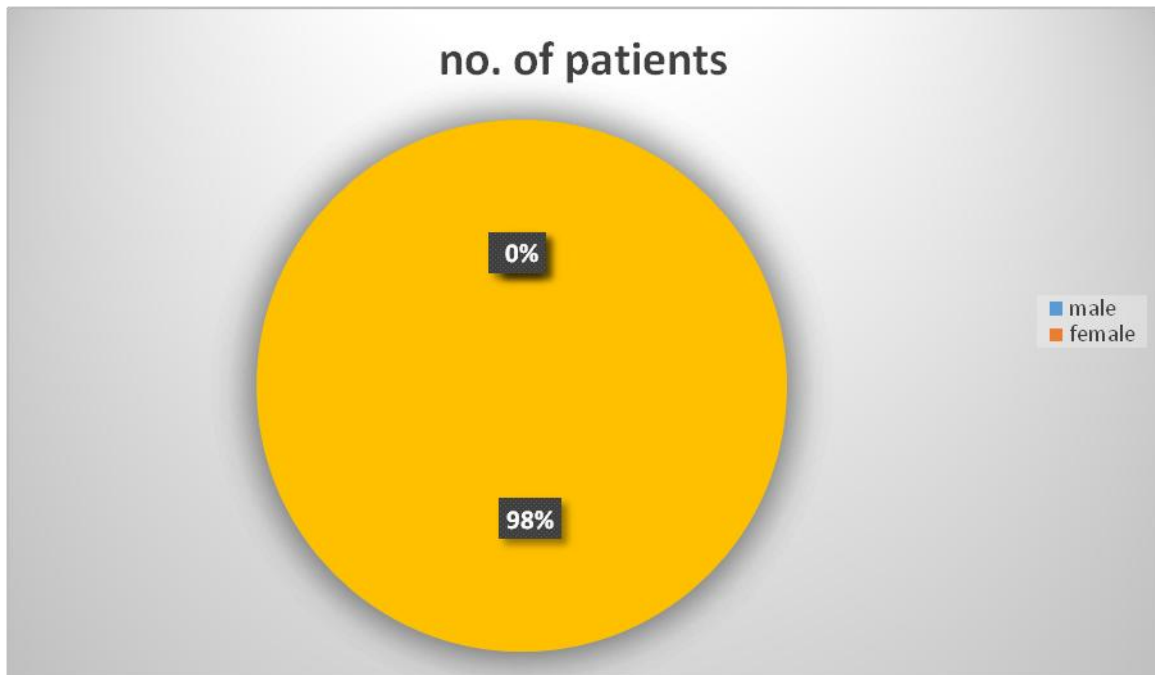


Figure 2

Among the co- morbidities all 50 patients were smokers (100%), 28 patients were tobacco chewer also (56%), 5 patients had diabetes (10%), 4 patients had hypertension (8%), 3 patients were diagnosed to be

suffering from coronary artery disease also who went for stenting in coronary arteries first later on for aorto bi-femoral bypass. 34 patients had hyperlipidaemia (68%), 15 patients had hyperhomocystinemia(30%).(fig 3)

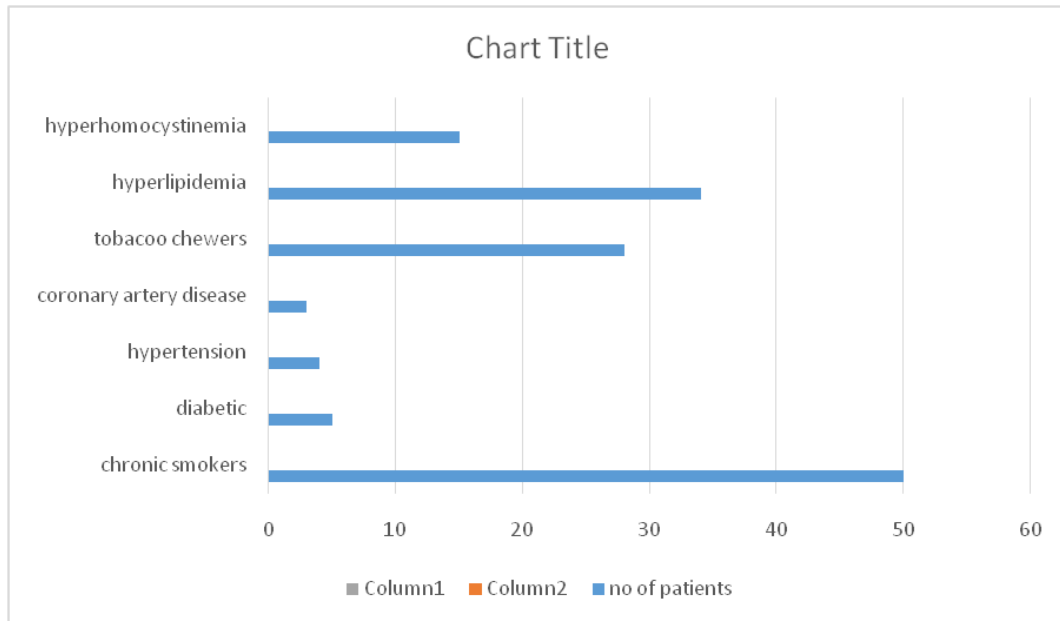


Figure 3: co-morbidities

According to Fontaine grades and Rutherford classifications for chronic limb ischemia based on claudication, non-healing ulcer, different pressures and gangrene 44 patients were Fontaine grade IIb and Rutherford 3(88%), 6 patients were Fontaine grade IV out of which 4 were Rutherford category 5 who had involvement of femoro-popliteal segment of unilateral side, 2 were Rutherford category 6 who had involvement of popliteal artery and lower segment also and had non-healing ulcer and gangrene of great to and little toe.(fig4)

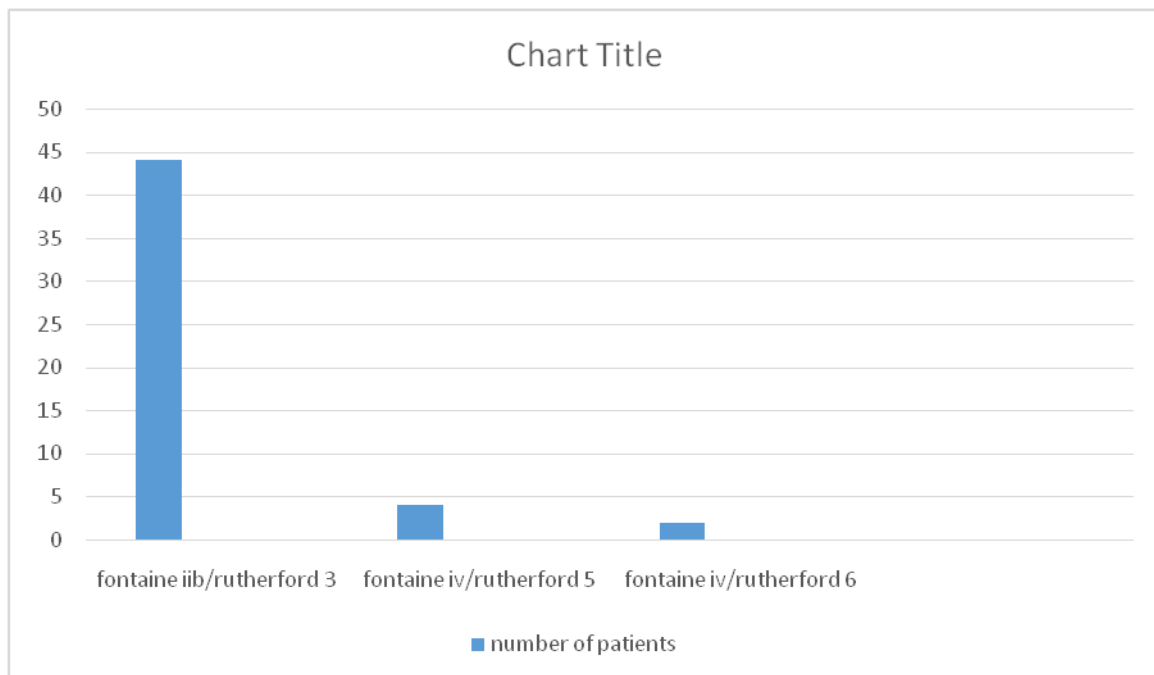


Figure 4

44 patients were operated for isolated Aorto iliac disease that is they underwent Aorto bi femoral bypass(ABF)(88%) out of which one patient had saccular aneurysm on right iliac artery and end to end anastomosis was done on aortic site, 4 patients underwent Aorto-bi-femoral bypass with femoro-popliteal

bypass ABF+FEM-POP)(8%), 2 patients under went Aorto bi femoral bypass with poplitealatherectomy and patch plasty ABF+PA+PP(4%).(fig 5).

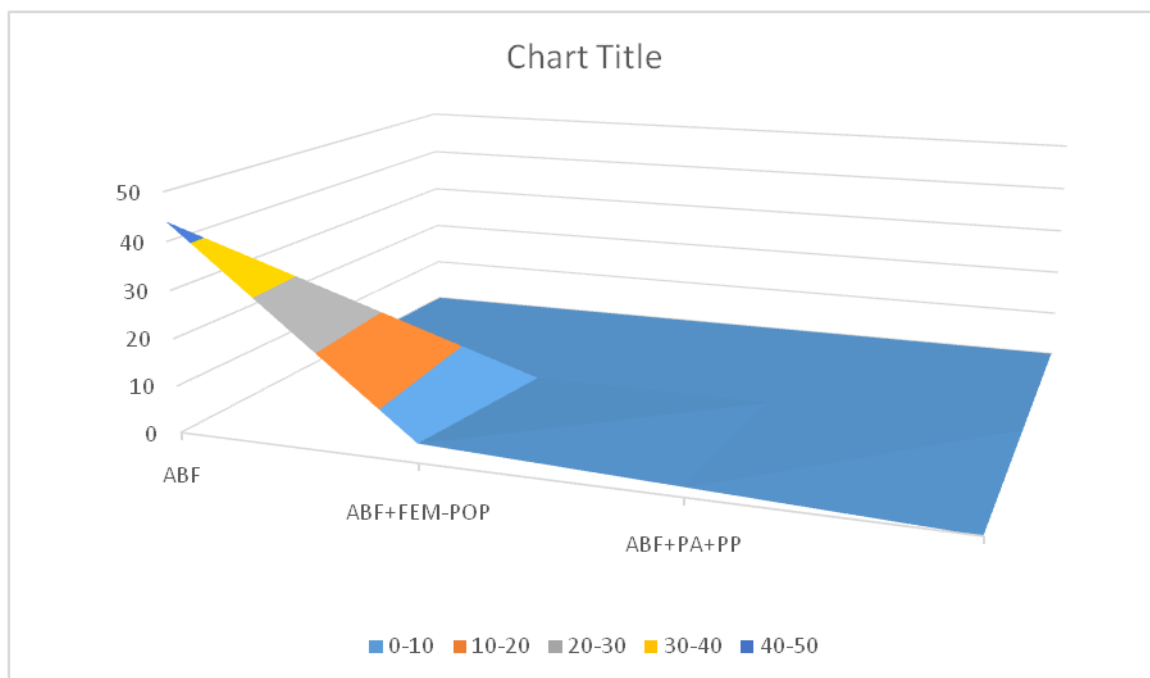


Figure 5

Out of all the patients we had one hcv positive case who postoperatively went in renal failure .other surgical complications we was 3 patients was re explored for bleeding out of which 1 patient was rexplored 3 times and diagnosed to have bleeding from proximal anastomosis that is aortic site(6%),5 patients had wound infection on femoral site and had long hospital stay(10%) , 2 patients underwent below knee amputation(4%) ,5 patients came with complete graft occlusion out of which 1 patient again went for Aortoiliac bypass and rest 4 patients underwent graft embolectomy bilaterally.1 patient we had who suffered burst abdomen .(fig 6)

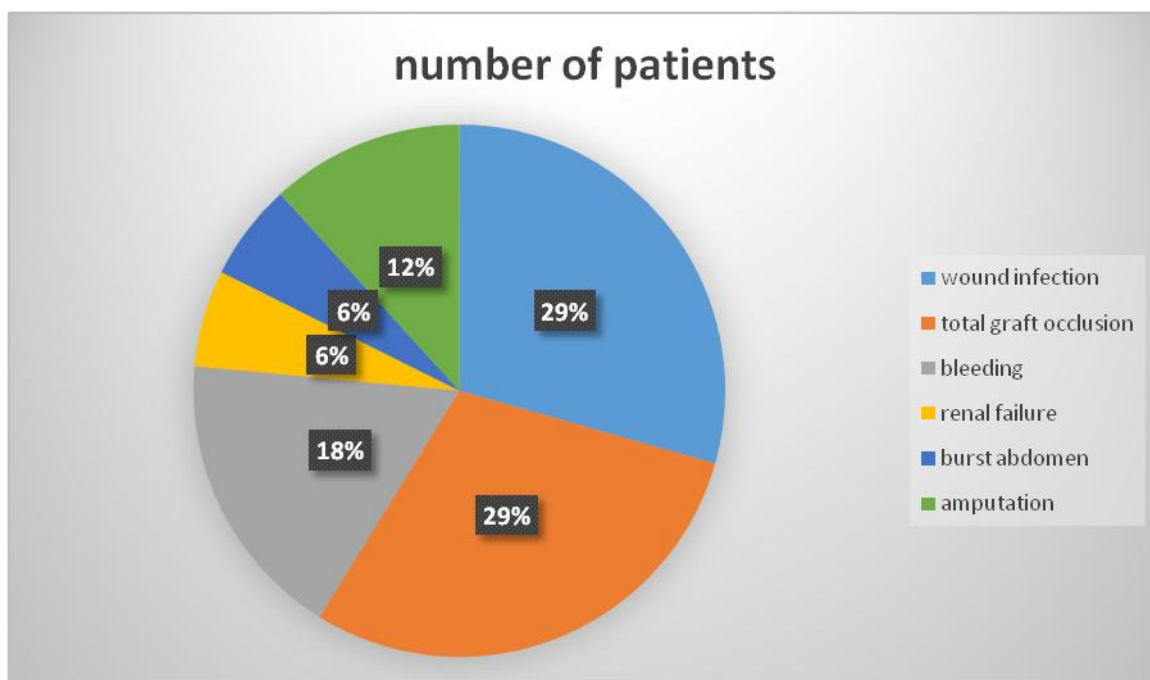


Figure 6

We suffered 2 mortalities out of which one patient we lost who went in renal failure and could not be revived from that even after dialysis, another patient we lost in which bleeding was the issue and went in DIC. All remaining patients are followed since last one and half years and are still in follow up.

V. Discussion

Peripheral artery disease as we know causes ischemic pain which is very chronic type of pain and we have seen patients sitting all night in the wards not able to sleep due to this ischemic pain. Leriche was the first person to recognise the possibility of surgical intervention for relief of ischemic pain due to Aortoiliac disease⁴. Now a day's many endovascular procedures are being available but still Aorto-bi-femoral bypass for chronic disease is still the gold standard⁵. Open Aorto-bi-femoral bypass gives a lot of ease in dealing with complications and also good exposure for anastomosis. Endovascular techniques are good but are limited to certain selected cases, primary patency rate is poor, reintervention and most importantly operating cost is very high⁶. Open Aorto-bi-femoral bypass is still the best choice for patients who can endure surgery¹ however endovascular is the option for patients with high risk⁷.

Earlier it was assumed that Aortoiliac disease is the disease of aged people like after fifth decade at least but we had 10 cases who were in the age group of 40 years-50 years age group. So Aortoiliac disease we can see now a days in early age groups also and it's not at all the disease of old now. There is a study done which states that people are having Aortoiliac disease in young age and with worse outcomes than older patient⁸. Another study done states that the incidence rate of atherosclerotic disease involving lower extremity is not as rare as it was thought earlier and is 14.6/100000 person years⁹. It's also being said in a study that onset of claudication at the age of 40 years or even earlier is of 7% incidence¹⁰. In our study we all our patients were smoker including a 1 female we had in our study and it's been seen all the studies done in relation to Aortoiliac disease that smoking is a strong component to cause this disease^{2,3}. Also the incidence of increasing this disease in young age and which is more aggressive smoking plays an important and strong factor^{8,9,10,11}. Diabetes, hypertension, hyperhomocytinemia, coronary artery disease and hyperlipidaemia all was present in some of our patients and its being well known risk factors for contributing to Aortoiliac disease^{1,2,3,4}. Also we had 3 patients who also had coronary artery disease and were treated for that. 1 patient underwent bypass and other 2 underwent stenting. There has been strong relation between coronary artery disease and peripheral vascular disease and there is incidence of having coronary artery disease 2 times higher in patients with peripheral artery disease than in patients without peripheral artery disease¹¹.

44 patients had intermittent claudication with 6 patients having rest pain. According to Fontaine and Rutherford classification patients were categorised as seen in chart above. As per Leriche syndrome intermittent claudication is important symptom to diagnose a patient for peripheral artery disease. Rest pain is ischemic pain at rest which is due to involvement of distal vessels and we had 6 patients who had rest pain even after strong analgesics which is very painful and we could see patients didn't had sleep since long. It was very relieving for us to see patients sleeping very deep in postoperative period as if they haven't slept since long which was very much true.

44 patients underwent isolated aorto-bi-femoral bypass, 4 patients underwent Aorto-bi-femoral bypass with unilateral femoro-popliteal bypass and 2 patients who had involvement of Aortoiliac vessel, popliteal artery and disease extending below popliteal bifurcation underwent aorto-bi-femoral bypass with popliteal artery atherectomy and patch plasty. Aorto-bi-femoral bypass as already said is the gold standard and is the safe modality and associated with low mortality and morbidity in case chronic aortic atherosclerotic occlusion¹². Atherectomy and patch plasty is reserved for the occlusions involving a local area with reasonable results as we did in 2 patients^{1,13}.

Every surgeon had experienced surgical complications and we too suffered from some of them in our study of 50 cases. Bleeding leading to re-exploration is one of commonest early complications after Aorto-bi-femoral bypass^{2,3,4}. Early complications we had were bleeding in 3 patients which lead to re-exploration. Bleeding was from aortic anastomotic site in all 3 patients and were resutured. Out of these 1 patient was re-explored 3 times as patient had consistent drainage, patient was hypertensive and preoperatively and post operatively. Patient was given i/v nitroglycerine infusion and i/v sodium nitroprusside infusion for controlling blood pressure. Finally we lost the patient as due to multiple blood transfusions patient went in DIC. Wound infection is another common early complications. We had 5 patients with wound infection at femoral site and all 5 patients suffered from diabetes. The incidence of wound infection was 10% which was also seen in another study done on 251 patients of Aortobi-femoral bypass^{14,15}. One patient suffered from renal failure and was on ventilator for long period. Patient was given dialysis but could not be revived from renal failure. Later he had bad lungs and ultimately we lost the patient. We think patient died due to renal failure due to supra renal clamping of aorta as the block was high¹⁶. One patient had burst abdomen which was given resuturing and later on patient was cured and was discharged after a long hospital stay of around 15 days. One patient underwent below knee amputation, this patient had non healing ulcer and gangrene preoperatively and had undergone

popliteal patch plasty. 5 patients suffered from total graft occlusion that is 10% incidence. The study done in Australia states the incidence of total graft occlusion up to 5 years is up to 15% which coincides with our study¹⁴. One patient out of the 5 again went for Aortobifemoral bypass and rest had recovered with embolectomy. All patients who suffered occlusion continued smoking after primary surgery which so could be a strong risk factor. The primary 5 year patency rates of primary Aortobifemoral bypass procedure as per latest data is 85% to 90%^{2,15}. We had primary patency rate of 90% till now in the last 2 years.

We had 2 in hospital mortalities that is 4% of mortality rate which is quite less than study done in 1997¹⁷.

VI. Conclusion

Aorto-bi-femoral bypass is the gold standard and safe technique for chronic Aortoiliac occlusive disease especially in a younger age which has more aggressive disease. Younger generation needs to be well-educated towards high risk factors like smoking to prevent the early incidence of disease. In developing countries like India we need better and cost-effective hospital care so that every person could timely afford the treatments like endovascular procedures. Endovascular procedures are latest techniques and can be gold standard in early diagnosed cases. Complications are the best teachers for a surgeon to make him learn and gain experiences for the right and wrong. Although we feel that we had success to a certain level with a low mortality rate but there is always a chance to improve and you struggle to learn till you operate.

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