

RESULT AND SURVIVAL AFTER SURGICAL REPAIR FOR ABDOMINAL AORTIC ANEURYSM; SINGLE CENTER STUDY

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Abstract

Objectives

The aim of this study was to evaluate mid-term result of open surgical repair for abdominal aortic aneurysm in elective setting, and overall survival during follow-up.

Methods

We performed a retrospective and descriptive study including 72 infrarenal AAA treated electively by open repair with mean follow up duration was 36 months (range, 18-52 months). Between January 2008 and January 2014. CT angiography (CTA) and arterial Doppler were the main imaging modalities used in both preplanning and follow up. Mid-term Survival and secondary interventions were reported.

Result

72 patients were admitted for elective open repair of AAA. Mean age was 66 years (SD=16), 59 patients (82%) were males. The mean aneurysm diameter was 5.8 cm range: 5.5 to 10 cm. The 30 days mortality rate was 2 patients (3%) one patient died due to bowel ischemia with atheroembolization from aneurysm sac, and the second patient developed fatal myocardial infarction on the third post operative day. the overall survival rate was 82% within the study period. Mid-term mortality was aneurysms unrelated except one patient. There were 2 patients (3%) who underwent late intervention due to graft related complications first one had aorto-enteric fistula treated by explantation and axillo-bifem . the second patient had proximal anastomotic aneurysm treated by new-aorto- iliac system (NAIS) was died after 3 days post operation.

Conclusion

Open surgical repair for AAA still remains a safe and durable method in experienced surgeons, even in the endovascular era and results in acceptable perioperative morbidity and mortality rates.

Introduction

Patients with abdominal aortic aneurysm (AAA) can be treated by endovascular aortic repair (EVAR) using stent graft or open repair (OR). Open surgical repair of abdominal aortic aneurysm has robust history, Initially described in 1952 by Dubost et al, open repair has undergone continuous evolution and refinement (1). Nowadays, The outcomes of surgical repair are encouraging, with perioperative mortality rates between 1% and 7% depending on high center volume and surgeons skills (2, 3). at the end of past century EVAR became the first choice to treat patients with AAA in certain conditions. Randomized controlled trials for abdominal aortic aneurysm have shown marked benefits of endovascular aneurysm repair (EVAR) with respect to 30-day mortality. However, the total mortality benefit was lost in these randomized controlled trials after 2 years. So, there was a resurgence of interest in open repair when long term results from the EVAR trials were published recently. (4, 5, 6).

The choice between EVAR and prophylactic surgical repair of an AAA for an individual patient at any given time should take into account (1) the risk for AAA rupture under observation; (2) the operative risk associated with repair, and by inference, the modality and location of repair; (3) the patient's life expectancy; and (4) the personal preferences of the patient.(7,8)

The aim of this study to show midterm results for surgical treatment of infrarenal AAA.our center recently published the results of long term outcome of EVAR. So; Patients can now be informed about the relative merits of surgical intervention versus EVAR.

Material and Methods

We performed a retrospective and descriptive study including 72 infrarenal AAA treated electively by open repair with mean follow up duration was 36 months (range, 18-52 months). Our hospital is a referral tertiary care center. We performed elective open repair procedures using mainly knitted Dacron grafts. The mean aneurysm diameter was 5.8 cm range: 5.5 to 10 cm. The database contained information about patients' demographics table (1), clinical history, interventions details, and follow up records which were collected from our registry. Medical ethics board approval was obtained from our hospital for this retrospective study.

Inclusion criteria include patients with elective infrarenal AAA repair who have aneurysm >5.5cm unsuitable for EVAR.exclusion criterion includes patients who had rupture, inflammatory aneurysm, unfit for surgery. Decision for intervention and patients assessment was done by multidisciplinary team .all aneurysm exposed through midline laprotomy. Configurations included; 3 patients (4%) aorto-bi-iliac, 67 patients (93%) aorto-bifem and 2 patients (2.7%) straight tube graft. Mean of hospital length of stay (LOS) was 6 days (range 5 -11). Thin slices contrast enhanced MD-CT angiography (CTA) and arterial Doppler were the main imaging modalities used in both preplanning and follow up. Post operation patients were admitted in ICU for close observation .after discharge, patients were followed up in the outpatients' clinic regularly after one month, 6 months, and yearly thereafter.

Patients' characteristics were summarized using descriptive statistics analysis. Results of continuous variables were given as mean and standard deviation, count and percentage for categorical variables.

The primary endpoint is to determine the midterm results and survival rate after surgical intervention for infrarenal AAA.

| | Patients with EVAR | |
|------------------------------|--------------------|-------|
| | N | % |
| Patients | 72 | - |
| Age in years (mean \pm SD) | 66 \pm 16 | - |
| Tobacco users | 60 | 83.3% |
| Hypertension | 52 | 72.2% |
| Ischaemic heart disease | 33 | 45.8% |
| Diabetes mellitus | 27 | 37.5% |
| CVA\TIA | 12 | 16.6% |
| Renal impairment | 5 | 7% |
| COPD | 24 | 33.3% |
| Anticoagulation\Antiplatelet | 48 | 66.6% |
| Aneurysm diameter | 5.5-10 cm | - |

Patients demography table(1)

Overall outcome table (2)

| 72 patients | N(%) |
|--|---------|
| Local complications | |
| Wound complication | 8 (11%) |
| Graft complication(thrombosis/infection) | 2 (3%) |
| Distal thrombosis/embolism | 0 |
| | 1(1%) |

| | |
|--|-------------------------|
| Spinal ischemia | |
| Bowel ischemia | |
| Systemic complications | |
| Cardiac | 6(8%) 12(17%) |
| Respiratory | 3(4%) |
| Renal | 0 0 |
| CVA | 2(3%) |
| DVT/PE | |
| 30 days mortality | 1(1%) |
| Late complications | 1(1%) |
| Aorto-enteric fistula | 3(4%) 1(1%) 1(1%) |
| Proximal anastomotic Pseudoaneurysm | |
| Abdominal wall hernia | |
| Small bowel obstruction | |
| Late mortality | |

Result

Between January 2008 and January 2014, 72 patients were admitted for elective repair of AAA Mean age was 66 years (SD=16), 59 patients (82%) were males and 13 (18%) females .The base line characteristics of patients demography are shown in table (1). Most patients were smoker and hypertensive .30 days mortality rate was 3% ,2 patients died, one due to bowel ischemia with atheroembolization from aneurysm sac , and the seconded patient developed fatal myocardial infarction on the third post operative day .the overall survival rate was 82% within the study period. Mid-term mortality was aneurysms unrelated according to our hospital registry except one patient.

During post operative period 12(17%) patients developed respiratory complications mainly pneumonia and respiratory failure all of them were treated conservatively .6 patients (8%) developed cardiac complications 2 patients with myocardial infarction one of them was treated by cardiac catheterization and stenting of coronaries, the

second patient was died .4 patients developed angina were treated medically. 3 (4%) patients had increase in base line kidney function test, all were treated conservatively and discharged with high creatinen but stable clinically .

During the period of follow up, 8(11%) patients developed groin and abdominal wall infections .6 patients were managed by dressing and antibiotics according to the wound culture. 2(3%) patients had localized graft infection at the groin were treated by cross over femorofemoral saphenous vein bypass and excision of infected limb graft. 2(3%) patients developed limb graft thrombosis due to bad out flow, embolectomy and femoropopliteal bypass were done. Also, 2(3%) patients had distal thrombosis were managed by popliteal embolectomy. Over all complications are shown in table (2).

There were 2 patients (3%) who underwent late intervention due to graft related complications .the first patients came to emergency unit due to upper gastrointestinal bleeding.

After resuscitation upper endoscopy was done. Our colleagues found blood in duodenum but The source of bleeding was unknown .CT-angiography gave us a clue of high suspicion of aorto-enteric fistula. We decided to operate upon him .we found a fistula between jejunum and proximal graft at the anastomosis site. We excised the graft and we did double layer closure of infrarenal aorta, aorta was buttressed by omentum and we did axillo-bifemoral bypass. The second patient came with abdominal pain and fever .CTA showed proximal anastamotic aneurysm. This patient was treated by excision of the graft and in-situ revascularization by creation of neo-aortoiliac system (NAIS) with autogenous femoral-popliteal vein, he died on the second post operative day for unknown cause. One patient developed small bowel obstruction was treated conservatively.

Discussion

30 days mortality mortality following open infrarenal aneurysm repair is outstanding, with superb outcomes achieved in every large study examined. World reported perioperative mortality and morbidity varied greatly. early mortality in large database, and population-based studies now approaches 3-4%(4,5,9,10). In fact, a meta-analysis study demonstrated an overall mortality of 3.2 %(11). Notably, this is in keeping with Even the most recent reports of infrarenal aneurysm repair from large-volume centers (12,13,14). In our study the perioperative mortality was 3% patients who included in this study were not suitable anatomically for EVAR, some of them carry high risk for surgery.

In the current era of EVAR, endovascular devices have become more versatile and outcomes more durable, patients who underwent surgical repair have become increasingly complex. This has been manifest in an increasing percentage of patients who require suprarenal and supraceliac aortic cross-clamps and who have concomitant aortoiliac occlusive disease (15, 16) despite the increased the surgery difficulties and complexity, the mortality and morbidity rate within the series were unchanged, or in some cases even reduced. In OVER trial (6), survival in open arm was 77% at 10 years and late aneurysm related death accounted for only 2% of mortality. Following open repair, cardiovascular disease, age, and cancer are the key drivers for long- term survival (18).late re-intervention for graft related complications do not significantly contribute to post operative death (17.19.20).in OVAR trial the leading Causes of death were cancer and non-aneurysm-related cardiovascular disease in 11% and 6.6% of the participants, respectively, and accounting for 52% of the mortality. In our study the survival rate was 82% and the late mortality due aneurysm related complications was 1% during the study period.

Open repair has low rate of late re-intervention and lower late aneurysm related mortality. both EVAR1 and DREAM trails reported their long term survival after a mean follow up of 6 and 6.4 years respectively (4.5).late re-intervention rate after open repair was 1.7% per year in EVAR1 trial, and 18.1% in the DREAM trial .late aneurysm related mortality was 2.2% and 0.6% in EVAR1 and DREAM respectively .Biancari et al (17), reported re-intervention rate of 10.6% at 8 years follow up with an associated operative mortality rate of 9%. Our data showed 1% late aneurysm related mortality and 9% late re-intervention rate demonstrated the open repair has compare favorably with previous studies.

Graft occlusion and anastomotic pseudoaneurysm were the more frequent graft-related indications for re-intervention, while graft infection and graft-enteric fistula occurred infrequently. (17.21.22.23) all re-interventions in our study were for symptomatic graft complications. In our center we routinely do follow up arterial duplex so we identify even asymptomatic complications.

Although it was thought that the decreased requirement of aortic neck required to deploy an aortic stent graft (EVAR) would lead to an increased patient population amenable to endovascular repair, there is still a clinically significant need for open aortic surgery (24). Expertise with open repair still remains essential for treatment of pararenal abdominal aortic aneurysms in the near future, especially for those patients who are declined for endovascular treatment. Open abdominal aortic aneurysm repair in the era of increasing endovascular options results in acceptable perioperative morbidity and mortality rates. (25, 26, 27).

Open surgical repair for AAA still remains as a safe and durable method in experienced surgeons, even in the endovascular era. To decide the best treatment decision many facts like patients' clinical condition, preference and the anatomical suitability for endovascular repair should be evaluated.

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