Stump pressure measurement as predictor for limb salvage in mycotic femoral artery aneurysms in recreational drug users

Thesis

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List of abbreviation

CA: Celiac axis

CEA: Carotid endarterectomy

CFA: Commonfemaoral artery

CFV: Common femoral vein

CHA: Common hepatic artery

CIA: Common iliac artery

DPS-CAR: Distal pancreatectomy ,Splenectomy and Celiac axis resection

DVT: Deep venous thrombosis

IFAP: Infected femoral arterypseudo aneurysm

IVC: Inferior vena cava

PFA: Profundafemoris artery

SFA: Superficial femoral artery

SFV: Superficial femoral vein

SP: Stump pressure

Abstract

Introduction: Infected femoral artery pseudo aneurysm (IFAP) is a severe complication in parenteral drug abusers.

Aim of the study: To prove that stump pressure above 60 mmHg measured intraoperatively after ligation of infected femoral artery pseudo aneurysms is sufficient parameter to depend upon for limb salvage.

Patients and methods: In this prospective study,20 patients presented to the vascular surgery emergency department atKasr-Al Aini hospital with infected femoral artery pseudo aneurysms due to parenteral drug injection. Measurement of stump pressures in the femoral arteries intraoperativly was done in all patients after ligation, and if it's more than 60 mmHg,no revascularization procedure would be done, and patients would be observed for signs of acute ischemia and if it occurs, revascularization would be considered and if the stump pressure is less than 60 mm Hg after ligation, revascularization would be considered from the start.

Results:

All patients were males.

The mean age was 36.9+-7.2

Stump pressure (SP) was<60mmHG in 8 patients who underwent trans-obturator bypass from the start.

Stump pressure (SP) was ≥60mmHG in 12 patients who underwent ligation without revascularization and only one patient suffered from acute ischemia following ligation to which trans-obturator bypass was done.

Follow up:-

In the 11 patients who underwent ligation without revascularization, 9 patients had mild claudication (82%), 1 patient had above knee amputation (9%) and 1patient died (9%) from 2nd haemorrhage following ligation.

On the other hand, those underwent trans-obturator bypass, 3patients complicated by graft occlusions (33%), two of them had above knee amputation, while the third had hip disarticulation.

One patient complicated by secondary haemorrhage (11%) from the extra-anatomical bypass, ligation of extra-anatomical bypass graft and graft removal was done and the patient had above knee amputation one week later.

5 patients are complicated with graft infection (55%), ligation of extra-anatomical bypass graft; graft removal and drainage of collections were done.

Four out of the 5 patients with infected grafts had above knee amputations, while other patient had only mild to moderate claudication.

Conclusions:

- Stump pressure measured in the SFA is a good indicator for need of revascularization as it's an important factor to predict the insufficiency of collateral blood flow.
- Trans-obturator bypass using synthetic graft has a high rate of complications in this study due to graft infection even when they are placed deep and away from the infected site due to several factors including septicemia affecting thesepatients and the high virulence of organisms.
- Ligation is a good management for infected femoral arterypseudo-aneurysms because it is easy, cost-effective,safe if the stump pressure is more than 60 mm Hgand because of the bad results of trans-obturator bypass in this group of patients and ligationshould be done in a healthy segment of vessels that hold ligature to avoid secondary hemorrhage.

بسم الله الرحمن

الرحيم

وقل اعملوا فسيرى الله عملكم ورسوله والمؤمنون105

صدق الله العظيم(الآية 105، سورة التوبة)

To my parents:-

When the world closed its doors on me, you both opened your arms for me. When people shut their ears for me, you both opened your hearts for me. Mom and Dad, thanks for always being there for me.

INTRODUCTION

INTRODUCTION

The pathogenesis of infected femoral artery pseudo-aneurysm (IFAP) in recreational drug usersconsists of introduction of infected material by non-sterile techniques combined with arterial trauma from inadvertent or even intentional arterial puncture when access to peripheral veins is impossible because of thrombosis**(Levi et al 1997).** If left untreated, IFAP can lead to hemorrhage, sepsis, limb loss, and death**(Arora et al 2001).**

The bacteriology ofinfected femoral artery pseudo-aneurysms underwent a constant change. Initially enterococcus, streptococcus and pneumococcus were responsible for the majority of mycotic aneurysms secondary to endocarditis in the pre-antibiotic era**. Brown et al 1984** reported a change in etiology to Staphylococcus aureus (28%) and Salmonella (15%) as the use of broad-spectrum antibiotics, immunosuppression and arterial puncture from vascular procedures and iv drug use has increased. A series of 26 patients by **Brossier et al 2010** showed the majority of mycotic infections were related to atypical bacteria, including Campylobacter fetus, Listeria monocytogenes, Mycobacterium tuberculosis, Coxiella burnetii and Aspergillus species. This trend may be attributed to improved diagnostic tests in detecting microorganisms and increasing numbers of patients with immunosuppression related to cancer, immunosuppressive therapy or long-term steroid therapy.**(Brossier et al 2010)**

The management options include excision and debridement of the IFAP with routine revascularization or with selective revascularizationor ligation of the CFA without arterial revascularization. The use of synthetic conduit is complicated because of the presence of infection and at the same time there is unavailability of autologous conduit from repeated drug abuse or deep venous thrombosis (DVT). Synthetic bypass grafts carry the risk of infection because of the presence of groin infection, even when they are placed deep and away from the infected site, usually in the form of trans-obturator bypass grafts. **(Reddy et al 1986)**

REVIEW OF LITERATURE

Variabilities in the anatomy of the femoral artery

The femoral artery is a continuation of the external iliac artery. The artery enters the thigh at a point midway between the anterior superior iliac spine and the pubic symphysis. Here it lies on the psoas major tendon, which separates the artery from the capsule of the hip joint.**(Sinnatamby, 2006)**

It descends along the anteromedial part of the thigh in the femoral triangle, enters and passes through the adductor (sub-sartorial) canal, and becomes **the popliteal artery** as it passes through an opening in adductor magnus near the junction of the middle and distal thirds of the thigh. Its first three or four centimetres are enclosed, with its vein, in the femoral sheath. The part of the artery proximal to the origin of profundafemoris is often clinically termed **the commonfemoral**, while that distal to the profunda origin is termed **the superficial femoral artery**. Rarely, the femoral artery divides, distal to the origin of the profundafemoris artery, into two trunks that reunite near the adductor opening. It may be replaced by the inferior gluteal artery, accompanying the sciatic nerve to the popliteal fossa and representing a proximal persistence of the original axial artery. The external iliac artery is then small, ending as the profundafemorisartery. **(Newell, 2008)**

Collateral circulation in proximal femoral occlusion (see figures 1,2,3):

After occlusion of the femoral artery proximal to the origin of the profundafemoris artery, five main anastomotic channels are available (see figures 1-3). These are between: branches of the superior and inferior gluteal arteries, the medial and lateral circumflex femoral arteries and the first perforating branch of the profundafemoris artery; the obturator branch of the internal iliac artery and the medial circumflex femoral artery; the internal pudendal branch of the internal iliac artery and the superficial and deep external pudendal branches of the femoral artery; a deep circumflex iliac branch of the