# Endovascular Management of Aorto-Iliac Occlusive Disease

Essay

*Submitted for partial fulfillment of master degree in general surgery*

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# العلاج بالقسطرة التداخلية لأمراض إنسداد الشريان الأورطي البطني والحرقفي

## رسالة

مقدمة توطئة للحصول على درجة الماجستير

## فى الجراحة العامة

## مقدمة من


**محمد على محمد البرى**

*بكالوريوس الطب والجراحة*


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**٢٠١١**

وَعَلَّمَكَ مَا لَمْ تَكُن تَعْلَمُ وَكَانَ
فَضْلُ اللهِ عَلَيْكَ عَظِيماً]

صدق الله العظيم

النساء آية "١١٣"

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***Mohamed El-Bery***

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# List of Abbreviation

| | |
|---|---|
| AAA | Abdominal aortic aneurysm. |
| ABI | Ankle brachial index. |
| ACP | American College of Physicians. |
| ADA | American Diabetic Association. |
| AIOD | Aortoiliac occlusive disease. |
| CFAs | Common femoral arteries. |
| CIA | Common iliac artery. |
| CTA | Computed tomography angiography. |
| DM | Diabetes Mellitus. |
| DSA | Digital subtraction angiography. |
| EIA | External iliac artery. |
| F | French. |
| FMD | Fibromuscular dysplasia. |
| HDL | High-density lipoprotein. |
| HR | Hazard ratio. |
| IC | Intermittent claudication. |
| IIA | Internal iliac artery. |
| LDL | Low-density lipoprotein. |
| MDCTA | Multiple detector-row computed tomography angiography. |
| MRA | Magnetic resonance angiography. |
| NAC | N-acetylcysteine. |
| PAD | Peripheral arterial disease. |

# List of Abbreviation

| | |
|---|---|
| PTA | Percutaneous transluminal angioplasty. |
| PVR | Pulse volume recordings. |
| TASC | Trans-Atlantic Inter-Society Consensus. |
| TG | Triglycerides. |
| TIA | Transmit ischemic attack. |

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# Aim of the Work

This work aims to discuss the endovascular techniques with its indications, limitations, outcome and complications in the management of significant aorto-iliac occlusive diseases in patients with chronic lower limb ischemia.

# Introduction

The infra-renal abdominal aorta and the iliac arteries are among the most common sites of chronic obliterative atherosclerosis in patients with symptomatic occlusive disease of the lower extremities **(DeBakey et al., 1985)**

Indeed, atherosclerotic narrowing or occlusion of these vessels, most commonly located at the aortic bifurcation, occurs to various degrees in most patients with symptoms of arterial insufficiency severe enough to require surgical revascularization. Because atherosclerosis is commonly a generalized process, obliterative disease in the aorto-iliac segment frequently coexists with disease below the inguinal ligament. Despite its generalized nature, however, the disease is usually segmental in distribution and is thereby amenable to effective surgical treatment. Even in patients with several levels of disease, successful correction of hemodynamic impairment in the aorto-iliac inflow system often provides satisfactory clinical relief of ischemic symptoms. In addition, careful assessment of the adequacy of arterial inflow is important even in patients whose primary difficulty located in the femoro-popliteal or tibial outflow segment if good and durable results of distal arterial

revascularization are to be obtained **(Brewster, 1997).**

Since the introduction of the initial reconstructive methods of thrombo-endarterectomy and homograft replacement in the late 1940s and early 1950s, great progress has been achieved in the surgical management of aorto-iliac occlusive disease. Currently, a variety of methods exist for accurate evaluation of the extent and hemodynamic severity of the disease process. In addition, improvements in the preoperative assessment of patient risk have helped to clarify the decision about the optimal management in individual patients.

Endovascular intervention for chronic lower limb ischemia has matured significantly in recent years. Catheter-based management of a wide variety of lesions has evolved from the stage of mere clinical feasibility to the level of reliability and durability required to become an integral tool in the treatment of occlusive disease. Today's vascular surgeon is in a unique position to combine his or her classical surgical training with their catheter-based interventions. Certainly, the potential advantages of percutaneous therapy as compared to surgical reconstruction are significant: No General anaesthesia or lengthy operations, shorter hospitalization, lower morbidity and mortality, **(Rutherford, 2005).**

# CHAPTER 1

# ANATOMY OF THE ABDOMINAL AORTA

The abdominal aorta is the largest artery in the abdominal cavity. As part of the aorta, it is a direct continuation of the descending aorta (of the thorax).The abdominal aorta (Fig.1) begins at the aortic hiatus of the diaphragm in front of the lower border of the body of the last thoracic vertebra and descend in front of the vertebral column, ends on the body of the fourth lumbar vertebra, commonly a little to the left of the middle line, by dividing into the two common iliac arteries. It diminishes rapidly in size, in consequence of the many large branches which it gives off. **(De Graaff and Van, 1998).**

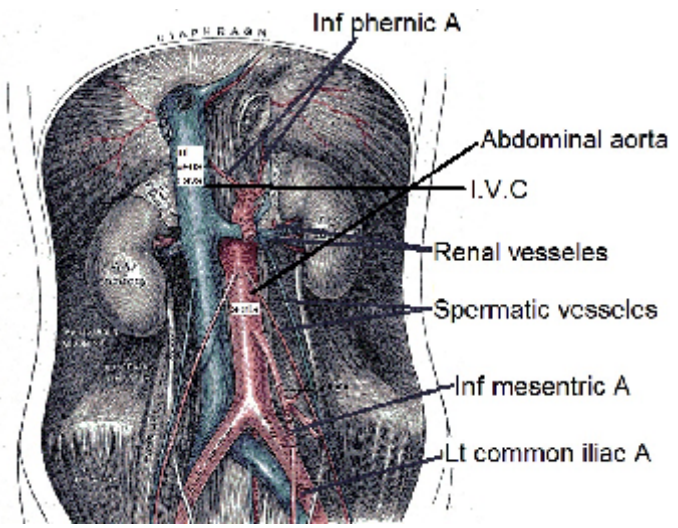


Fig. (1). the abdominal aorta and its branches (Quoted from **De Graaff and Van., 1998**).

## Relations:-

**Anteriorly** The abdominal aorta is covered by the lesser omentum and stomach, the branches of the celiac artery and the celiac plexus, the pancreas, the left renal vein, the inferior part of the duodenum, the mesentery, and aortic plexus **(De Graaff and Van1998)**.

**Posteriorly** it is separated from the lumbar vertebra and intervertebral fibrocartilages by the Ant. longitudinal ligament and left lumbar veins **(De Graaff and Van1998)**.

**On the right side** it is in relation above with the azygos vein, cisterna chyli, thoracic duct, and the right crus of the diaphragm. The inferior vena cava is in contact with the aorta below **(Tortora and Gerard J 1994).**

**On the left side** are the left crus of the diaphragm, the left celiac ganglion, the ascending part of the duodenum, and some coils of the small intestine **(De Graaff and Van1998).**

## Collateral Circulation:-

It carried on by the anastomoses between the internal mammary and the inferior epigastric. By the free communication between the superior and inferior mesenteric, if the ligature were placed between these

vessels or by the anastomosis between the inferior mesenteric and the internal pudendal, when the point of ligature is below the origin of the inferior mesenteric and possibly by the anastomoses of the lumbar arteries with the branches of the hypogastric **(Tortora and Gerard J 1994).**

## Branches:-

- Visceral.
- Parietal.
- Terminal.

**Visceral and Parietal Branches are.**

- Celiac.
- Inferior Phrenic.
- Superior Mesenteric.
- Lumbar.
- Inferior Mesenteric.
- Middle Sacral.
- Middle Suprarenal.
- Renal.
- Testicular or ovarian (in the female).

**Terminal branches are.**

- Common iliacs arteries.

**(Valentine and wind, 2003).**