Thoracic Endovascular Aortic Repair in Management of Aortic Dissection

Essay

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List of Abbreviations

Abbr.	Full-term
AAA	Abdominal Aortic Aneurysm
AAD	Ascending aortic dissection
AAS	Acute Aortic Syndrome
ACS	Acute coronary syndrome
BMT	Best medical therapy
CI	Confidential interval
CT	Computed tomography
CXR	Chest X-ray
DSA	Digital subtraction angiography
FDA	Food and Drug Administration
FL	False lumen
HR	Heart rate
ICP	Intracranial pressure
IDE	Investigational device exemption
IMA	Inferior mesenteric artery
IMH	Intramural hematoma
INSTEAD	Investigation of stent grafts in patients with type B aortic dissection
IRAD	International Registry of Aortic Dissection
IV	Intravenous
IVUS	Intravenous ultrasound
MRA	Magnetic resonance arteriography

MRI .....: Magnetic resonance imaging

OMT.....: Optimal medical treatment

OS .....: Open surgery

PAU .....: Penetrating aortic ulcer

RTAAD.....: Retrograde type A aortic dissection

SCA.....: Subclavian artery

SMA .....: Superior mesenteric artery

SVC.....: Superior vena cava

TAAD.....: Type A aortic dissection

TBAD .....: Type B aortic dissection

TEE.....: Transesophageal echocardiography

TEVAR.....: Thoracic endovascular aortic repair

TTE.....: Transthoracic echocardiography

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Abstract

Background: Aortic dissection is a fatal disease in spite of it's low incidence (4.7-6/100.000) Thoracic endovascular aortic repair (TEVAR) plays an important role in management of type B aortic repair.

Aim of work: to assess the role of TEVAR in complication and uncomplicated type B aortic dissection

Conclusion: TEVAR is a less invasive technique than other surgical modalities for aortic dissection, and it carries great potential as a reliable management modality for acute dissection. However, it needs furthermore studies regarding long-term outcome especially after uncomplicated TBAD.

Keywords: Thoracic, Endovascular Aortic Repair, Aortic, Dissection

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INTRODUCTION

Although Aortic dissection is an uncommon disease, its outcome is frequently fatal with many patients die prior to diagnosis or before presentation to the hospital, also physical findings may be absent or if present could be a diverse range of other conditions ***(Hagan et al., 2000).***

High clinical suspicion, CT, MRI and transesophageal echocardiography are fair accurate modalities for diagnosis, while the diagnosis is missed in up to 38% of patients on initial evaluation ***(Hagan et al., 2000).***

Aortic dissection is divided into acute & chronic types, depending on the duration of symptoms. Acute Aortic dissection is present when diagnosis is made within 2 weeks after the initial onset of symptoms. Chronic is when initial symptoms are more than 2 weeks duration, above one third of patients with Aortic dissection categorized as chronic, where the commonest site of initial dissection is the ascending Aorta ***(Debakey et al., 1965).***

Anatomically, dissection can be classified either by the Debakey, or Stanford classification ***(Debakey et al., 1965; Dailey et al., 1970).***

The Debakey I involves both ascending & descending Aorta, Debakey II only ascending, Debakey III only descending, while Stanford classification has two types, Type A involving the ascending Aorta regardless the entry site, where type B involving Aorta distal to organ of left subclavian artery ***(Dailey et al., 1970).***

Men are more affected, with a male to female ratio ranges from 2:1 to 5:1 in different series ***(Wilson et al., 1982).***

The most common predisposing factor is hypertension ***(Spittel et al., 1993).***

While Aortic diseases such as dilatation, aneurysm, chromosomal aberrations as Turners syndrome, aortic arch hypoplasia, coarctation of the Aorta, bicuspid Aortic valve & hereditary connective tissue disease as Marfan syndrome & Ehler Danlos syndrome are well known predisposing factors ***(Eisenberg et al., 1993).***

Aortic dissection may be formed via an intimal rupture resulting in cleavage formation & propagation of dissection into the media, or due to intramural hemorrhage followed by hematoma formation in the media and intima perforation. Given that ntimal flap is the most characteristic feature of Aortic dissection ***(Wilson et al., 1982).***

Manifestations can be in the form of pain or manifestations related to organ system involvement, while pain is the most common presenting symptom ***(Hagan et al., 2000).***

More than one third of the patients exhibits signs & symptoms related to organ system involvement ***(Khan et al., 2001).***

The most common mechanism of organ system involvement is the development ischemia caused by the obstruction of branch artery originating from the Aorta ***(Khan et al., 2001).***

Medical, surgical & endovascular treatments are options for management of Aortic dissection, Historically in the early 1960s ***Wheat et al. (1965)*** introduced drug therapy for Aortic dissection using Reserbine & Guanethedine, Now a combination of B blocker & vasodilator (ie, Sodium Nitroprusside) is standard drug treatment. While surgical intervention is indicated in all patients with proximal dissections sparing patients having serious conditions that contraindicates surgery ***(Borst and Laas, 1993).***

TEVAR also plays an important role in management of proximal Aortic dissection (Stanford A) where 10-30 % of cases are not accepted for surgery and 30-50% are technically amenable for TEVAR which reveals promising

early results in type A Aortic dissection who are poor candidates for surgical repair ***(Nienaber et al., 2016).***

Meanwhile, 30 days mortality rate reaches 11% whereas the 1 year mortality rate might reach 33% for those treated with TEVAR ***(Mark et al., 2012).***

On the other hand, surgical treatment offers 30 days mortality rate 11-14 % in young patients (20-40 years old), while this increases with age to reach 25% in octogenerics ***(Rylski et al., 2014)***.

Although the role of TEVAR in the treatment of uncomplicated acute type B Aortic dissection remains controversial, it turn to be a viable choice in treatment of acute type B associated with life threating complications, with a dramatic improvement of perioperative results & 30-days mortality less than 10% ***(Zeeshan et al., 2010).***

Furthermore, **TEVAR** is associated with fewer permanent complications & excellent long-term survival, & it is often sufficient to relieve malperfusion, considering immediate concomitant procedures in addition to later re-intervention may be needed ***(Steuer et al., 2011).***

AIM OF WORK

To review the recent guidelines, role and possibilities of TEVAR in the management of the Aortic dissection in comparison to the other surgical and medical modalities of treatment which are generally practiced.