ENDOVASCULAR REPAIR OF LOCALIZED PATHOLOGICAL LESIONS OF THE DESCENDING THORACIC AORTA.

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By

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LIST OF ABBREVIATIONS

AAAs: Abdominal aortic aneurysms
AD: Aortic dissection
AOR: Ascending aortic replacement
ASA: American society of anaesthetists
CAD: Coronary artery disease
COPD: chronic obstrtuctive pulmonary disease
CRP: C-reactive protein
CT: Computered tomography
CVA: Cerebrovascular accident
CVS: Cardivascular surgery
DA: Dissecting aorta
Dist land diam: distal landing diameter
DTA: Descending thoracic aorta
ePTFE: expanded Polytetrafluororthylene
ICU: Intensive care unit
IMH: Intramural hematoma
ISCH: Ischemia
LPS: Low profile system
LSA: Left subclavian artery
MRA: Magnetic resonance angiography
MRI: Magnetic resonance imaging
PAU: Penetrating aortic ulcer
Prox land diam: Proximal landing diameter
PTFE: Polytetrafluororthylene
SCa: Subclavian artery
TAAs: Thoracic aortic aneurysms
TAAAs: Thoraco-abdominal aortic aneurysms

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TAD: Thoracic aortic disease

TAG: Tubular aortic graft

TDS: Thoracic delivery system

TEE: Transthoracic esophageal echocardiography

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ABSTRACT

Objective: The endoluminal stent-graft represents an attractive and a less invasive technique in the treatment of the various diseases of the descending thoracic aorta. The purpose of this study was to evaluate the endovascular stent-graft *Talent* in the treatment of various localized diseases of the descending thoracic aorta.

Methods: Over a 3-year period, thoracic endograft Talent were placed in 40 patients with a high surgical risk, presenting localized lesions of the descending thoracic aorta: Degenerative aneurysm (n=13), Acute traumatic rupture (n=11), Acute Stanford type B aortic dissection (n=6), False aneurysm (n=7) and Penetrating atherosclerotic ulcer (n=3). 15 patients (37.5 %) were treated as emergencies. The feasibility of endovascular treatment and sizing of the aorta and stent-grafts were determined pre-operatively by Magnetic Resonance Angiography (MRA) and intra-operative angiography. Immediate and mid term technical and clinical success were assessed by clinical and MRA follow-up.

Results: Endovascular treatment was completed successfully in all 40 patients with no conversion to open repair or intra-operative mortality. The mean operative time was 37.5+/-7 minutes. The overall 30-day mortality rate was 10 % (n=4) all in emergency cases, causes not related to the endograft. The primary technical success

was 92.5 %. The mean follow-up period was 15 +/-5 months. The survival rate was 95% (n=35). Diminution of the aneurismal size was observed in 47.5% (n=19).

Conclusion. Endovascular treatment of the various localized diseases of the descending thoracic aorta is a promising, feasible, alternative technique to open surgery in well selected patients.

Author Key words: Stent-graft, Aneurysm, descending thoracic aorta, Type B dissection, Trauma, atherosclerotic ulcer.

Introduction

The traditional management of thoracic aortic diseases is based on surgical graft replacement. Although the results of surgical treatment have steadily improved over the past 20 to 30 years, a significant peri-operative morbidity and mortality do occur, particularly in those patients who have coexisting medical illnesses or who have previously undergone one or more operations for treatment of intra-thoracic diseases (Neuhauser et al., 2004).

In this regard, a less invasive approach is desirable, especially in patients who are unfit for open surgery, or who can be managed with conventional surgery only with a high operative risk as acute aortic rupture. In these patients, aortic replacement under general anaesthesia and possibly extra-corporeal bypass may not be tolerated (Dake., 2001).

Endovascular stent-grafts offer an alternative treatment approach that may be less invasive, and that may involve a lower risk and a shorter hospital recuperation than traditional operative therapy (Orend et al., 2003).

The concept of transluminally placed endovascular stent-grafts was initially proposed by *Dotter and Judkins* in 1964. Subsequently, a number of researchers performed feasibility studies using experimental animal models of abdominal aortic aneurysms (Orend et al., 1996). *Parodi, Palmaz and Barone* in 1991

reported the first successful clinical endovascular graft repair of an infrarenal abdominal aortic aneurysm in Argentina (Parodi et al., 1991).

In 1994, *Dake* and associates evaluated the feasibility of a transluminal stent-graft placement to treat descending thoracic aortic aneurysms.

Recently, the clinical use of endovascular stent-grafts was reported for the management of a variety of arterial pathologies, including abdominal aortic aneurysms, thoracic aortic aneurysms, subclavian artery aneurysms, iliac artery aneurysms, arteriovenous fistulas with promising short-term and mid-term results (Scheinert et al., 2004).

The early application of these new techniques was challenging because the primitive nature of the devices employed; however, in the relative short period of time since their introduction, it already appears likely that stent-grafts will play a significant role in the future management of vascular diseases (Scheinert et al., 2004).

Hypothesis:

The recent application of endovascular devices to the infrarenal abdominal aortic segment with good results comparable to open surgery, has tempted researches to apply the same technique in an other more difficult segment of the aorta, the thoracic aorta. It seems that the technique is feasible, safe and durable.

Aim of the work

This work explores the feasibility and the durability of endovascular stent-grafts treatment of thoracic descending aorta lesions. We will investigate the advantages and disadvantages of this procedure included safety, duration of the procedure, hospital stay and its complications within a follow up period of 12 months.