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ORIGINAL ARTICLE

# Operated descending thoracic and thoracoabdominal atherosclerotic aortic aneurysm prognosis



*Pronostic des anévrismes athéromateux opérés de l'aorte thoracique descendante et thoraco-abdominale opérés*

Antoine Monnot<sup>a</sup>, Bruno Pochulu<sup>a</sup>, Fabien Doguet<sup>b</sup>,  
Sylvie Godier<sup>c</sup>, Vincent Scherrer<sup>c</sup>, Didier Plissonnier<sup>a,\*</sup>

<sup>a</sup> Service de chirurgie vasculaire, CHU de Rouen, 1, rue de Germont, 76031 Rouen cedex, France

<sup>b</sup> Service de chirurgie cardiaque, CHU de Rouen, 1, rue de Germont, 76031 Rouen cedex, France

<sup>c</sup> Service d'anesthésie réanimation, CHU de Rouen, 1, rue de Germont, 76031 Rouen cedex, France

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## KEYWORDS

Classifications;  
Aortic aneurysm;  
Aortic surgery;  
Atherosclerosis;  
Survival analysis

## Summary

**Background.** – The long-term survival of patients treated from descending thoracic aneurysm (DTA) is well known, more than those treated from a thoracoabdominal aortic aneurysm (TAAA). Moreover, studies are rarely focused on the aneurysmal etiology and include both degenerative and post dissecting aneurysms. The aim of this study is to compare the long-term survival of patients operated from DTA or TAAA due to degenerative atherosclerosis.

**Methods.** – Thirty-nine atherosclerotic aneurysm patients were operated between January 2007 and July 2015 at Rouen University Hospital. Eighteen DTA patients were operated by TEVAR and 21 TAAA patients (8 type I and 13 type III) by open approach. The main endpoint was remote survival patients.

**Results.** – Overall, the initial population was similar in the two groups. However, one third of DTA were treated in context of emergency for painful aneurysm versus 9.5% of patients with TAAA ( $P=0.066$ ). Survival median of 18 DTA was 18 months (1–68). Survival median of 21 TAAA followed was 66 months (1–91). Survival in both groups was statistically different with the log-rank test ( $P=0.044$ ).

\* Corresponding author.

E-mail address: [didier.plissonnier@chu-rouen.fr](mailto:didier.plissonnier@chu-rouen.fr) (D. Plissonnier).

**MOTS CLÉS**

Anévrisme aortique athéromateux ;  
Anévrisme thoraco-abdominal ;  
Anévrisme thoracique descendant ;  
Traitement endovasculaire ;  
Chirurgie ouverte ;  
Courbe de survie

**Conclusions.** – Long-term prognosis of atherosclerotic DTA may be worse than that of TAAA's. This retrospective study reflects experience in the management of DTA and TAAA in a single-center. Prospective data in patients treated with endovascular procedures for DTA or TAAA, with fenestrated or branched endoprosthesis, are warranted to confirm these results.  
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**Résumé**

**Contexte.** – La survie à long terme des patients opérés d'un anévrisme aortique thoracique descendant (DTA) est mieux connue que ceux traités pour un anévrisme thoraco-abdominal (TAAA). Les études se concentrent rarement sur l'étiologie anévrismale et confondent les anévrismes dégénératifs et post-dissections. L'objectif de cette étude est de comparer la survie à long terme des patients opérés d'un DTA et d'un TAAA d'étiologie athéromateuse.

**Méthodes.** – Trente-neuf patients atteints d'un anévrisme athéromateux ont été opérés entre janvier 2007 et juillet 2015 au CHU de Rouen. Dix-huit DTA ont été opérés par TEVAR et 21 patients TAAA (8 type I et 13 type III) par approche chirurgicale ouverte. Le critère de jugement principal était la survie à distance des patients opérés.

**Résultats.** – La population initiale était globalement similaire dans les deux groupes. La médiane de survie des 18 DTA était de 18 mois (1–68). La médiane de survie des 21 TAAA était de 66 mois (1–91). La survie dans les deux groupes était statistiquement différente avec le test log-rank ( $p=0,044$ ).

**Conclusion.** – Parmi l'étiologie athéromateuse, le pronostic à long terme des DTA pourrait être différent de celui des TAAA.

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**Introduction**

Operative mortality and morbidity of descending thoracic aortic aneurysms (DTA) and thoracoabdominal aortic aneurysm (TAAA) is known. For DTA treatment, the mortality rate reaches 5–6% during endovascular approach and 16% during open approach. For TAAA treatment, the mortality rate ranges between 5 to 10% after endovascular procedures and between 5 to 15% after open approach [1]. The endovascular approach has reduced that of DTA [2]. A meta-analysis reported that endovascular approach reduces the operative 30-days mortality (5.5%) when compared to open repair (16.5%) [3].

Improved surgical techniques such as partial cardiopulmonary bypass (CPB) [4] and cerebrospinal fluid (CSF) drainage [5] have reduced surgical aggression related to TAAA treatment [6]. In literature, the long-term survival after treatment is difficult to evaluate. For DTA long-term outcomes, most studies are focused on the comparison between endovascular and open repair. Mostly these studies include post dissection or degenerative atherosclerotic thoracic aneurysms. For TAAA, long-term survival after treatment remains unclear in studies which report very heterogeneous aortic aneurysmal etiologies of diseases.

On the other hand, mini-invasive feature of endovascular techniques allowed the treatment for a larger population. In the UK, between 2005 and 2010, the number of DTA treated increased from 0.7 to 1.9 per 100,000 people with a prevalence for 75 years old patients and higher. However, over the same period, no significant mortality reduction

of these patients was observed despite the contribution of endovascular [7] treatment. The long-term benefit of DTA treatment for the elderly population seems questionable due to the high risk of short-term cardiovascular events [8]. We hypothesize that atherosclerotic etiology of aneurysmal disease plays an important role in the long-term prognosis of these patients. Indeed, dissection etiology most frequently affects young patients [9] while atherosclerotic etiology is accompanied by high cardiovascular risk factors [10].

The goal of this study was to compare the long-term survival of patients operated from DTA or TAAA secondary to a single etiology: degenerative atherosclerosis.

**Material and methods**

We performed a retrospective, observational and single-center study from prospectively collected data on 39 operated patients between 01 January 2007 and 01 July 2015 at Rouen University Hospital. Eighteen atherosclerotic DTA operated patients and twenty-one atherosclerotic TAAA operated patients (eight Crawford type I and thirteen type III) were included. As recommended, the aortic diameter was always up to 6.0 cm [11]. Exclusion criteria were post dissecting aneurysms, type 4 TAAA, aneurysms affecting the aortic arch and ruptured aneurysms. The main endpoint was remote survival of operated patients.

The initial population was similar across the two groups (Table 1).

Criteria definition: among past history, diagnosis of MI (myocardial infarction) was documented by an increased

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