Low rate of reoperations after acute type A aortic dissection repair from The Nordic Consortium Registry

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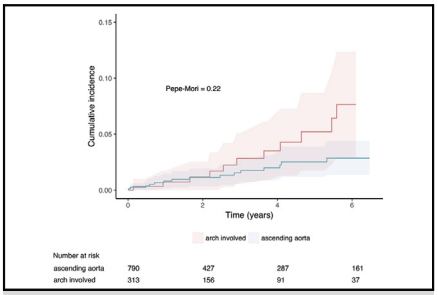
ABSTRACT

Objectives: To describe the relationship between the extent of primary aortic repair and the incidence of reoperations after surgery for type A aortic dissection.

Methods: A retrospective cohort of 1159 patients treated for type A aortic dissection at eight Nordic low- to medium-sized cardiothoracic centers from 2005 to 2014. Data were gathered from patient records and national registries. Patients were separately divided into 3 groups according to the distal anastomoses technique (ascending aorta [n = 791], hemiarch [n = 247], and total arch [n = 66]), and into 2 groups for proximal repair (aortic root replacement [n = 285] and supracoronary repair [n = 832]). Freedom from reoperation was estimated with cumulative incidence survival and Fine-Gray competing risk regression model was used to identify independent risk factors for reoperation.

Results: The median follow-up was 2.7 years (range, 0-10 years). Altogether 51 out of 911 patients underwent reoperation. Freedom from distal reoperation at 5 years was 96.9%, with no significant difference between the groups ($P = .22$). Freedom from proximal reoperation at 5 years was 97.8%, with no difference between the groups ($P = .84$). Neither DeBakey classification nor the extent of proximal or distal repair predicted freedom from a later reoperation. The only independent risk factor associated with a later proximal reoperation was a history of connective tissue disease.

Conclusions: Type A aortic dissection repair in low- to medium-volume centers was associated with a low reoperation rate and satisfactory midterm survival. The extent of the primary repair had no significant influence on reoperation rate or midterm survival. (J Thorac Cardiovasc Surg 2018;■:1-10)



Cumulative incidence of dissection reoperations between the extent of distal anastomosis.

Central Message

The midterm reoperation rate after acute type A aortic dissection surgery is low. The extent of proximal or distal repair did not significantly influence the cumulative incidence of reoperation.

Perspective

Nordic Consortium for Acute Type A Aortic Dissection results show a low midterm reoperation rate and satisfactory survival with no significant differences between the different extents of primary surgery. These results are from nonhigh-volume cardiothoracic centers, and may also encourage other low-to-medium volume centers to carefully weigh achievable long-term benefits against a possibly elevated initial risk with a more radical approach.

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Abbreviations and Acronyms
ATAAD = acute type A ascending aortic dissection
NORCAAD = Nordic Consortium for Acute Type A Aortic Dissection

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Acute type A aortic dissection (ATAAD) is an aortic emergency requiring immediate surgical intervention, reflected in high in-hospital mortality that ranges from 4.2% to 28.6% in previous studies.[1-4] For those who survive the initial critical period, the long-term actuarial survival up to 10 years is reported to be in the 53.4% to 65.0% range, and mainly influenced by general cardiovascular risk factors.[5-9]

For the past 2 decades, large multinational databases have been created to evaluate different surgical approaches for ATAAD and their influence on complications and outcomes. The most extensive ones are the International Registry of Acute Aortic Dissection and The German Registry for Acute Aortic Dissection Type A.[1,10] A more recent large, multicenter database is the Nordic Consortium for Acute Type A Aortic Dissection (NORCAAD), which consists of 8 small- to medium-sized cardiothoracic centers in University Hospitals in Sweden, Denmark, Finland, and Iceland. So far, a total of 1159 consecutive ATAAD cases from 2005 to 2014 have been included in the NORCAAD registry.[11]

Most studies on ATAAD in the literature are either single center studies with small patient cohorts or larger studies with focus mainly on short-term complications and 30-day or in-hospital mortality following surgical repair.[8] However, studies on mid- and long-term outcomes, including evaluation of complications, later reoperation on the aortic valve and aorta and also morbidity, are more uncommon. According to available reports, between 8.7% and 13.5% of patients require a cardiovascular reoperation following the immediate postoperative period of a ATAAD repair.[12-16] These reoperations are often technically challenging with a high initial mortality and morbidity. There is scarce information on risk factors for late reoperations, which is important when these patients are being followed-up clinically. Furthermore, few previous studies have investigated whether the surgical approach at the primary operation influences the rate of late reoperations after ATAAD. In this substudy of NORCAAD, we therefore investigated proximal and distal reoperations after midterm follow-up, and evaluated the association between the extent of the primary repair and later reoperations.

MATERIALS AND METHODS

Patient Population

The cohort for this study is from the NORCAAD study. The NORCAAD study design has been described previously.[11] The population at risk is estimated at 9,500,000 inhabitants. Consecutive patients (n = 1159) who underwent surgery for ATAAD in 8 academic cardiothoracic centers between January 1, 2005, and December 31, 2014, have been included in the registry. Patient information was collected retrospectively from hospital records and mortality data gained from national population registries. Each center was responsible for its own patient data collection and for approval from its ethical committee. There were incomplete data for reoperations and/or regarding the extent of primary surgery in 28 patients, leaving 1131 cases for analysis.

Definitions

The definition of an ATAAD was a dissection involving the ascending aorta with or without involvement of the arch and descending aorta, and for which surgery was performed within 2 weeks from the first symptoms. ATAAD was divided into DeBakey type I and II; DeBakey I involved the descending aorta and in DeBakey II, the dissection ended before the innominate artery. Pseudoaneurysms were defined as aneurysms formed adjacent to sutures lines. An anastomosis between the tubular part of a vascular prosthesis and the aorta sutured under direct vision during circulatory arrest were defined as an open-distal anastomosis, and clamp-on anastomosis as an anastomosis performed with an aortic crossclamp distal to the suture line.

Primary Surgery

We defined each primary surgical procedure into 1 of the following categories: distal repair was classified as the ascending aorta only (distal anastomosis proximal to the origin of the innominate artery), hemiarch replacement (resection of the underside of the arch not requiring arch vessel reimplantation), and total arch replacement (distal anastomosis extending distal to the left subclavian artery with arch vessel reimplantation either separately or as islands). Proximal repair was classified as isolated supracoronary replacement with or without valve resuspension or surgery involving the aortic root (composite valve and conduit; that is, Bentall procedure, separate valve remodeling, or valve reimplantation like Yacoub or David procedure). For the cumulative incidence analysis we combined hemiarch and total arch replacement groups because there were few events in the latter group.

Reoperation

Any reoperation was defined as any cardiac or aortic surgery that could be related to primary ATAAD repair, excluding reoperations due to bleeding. The main indications for a reoperation in the different centers were similar during the whole study period and mainly included an aneurysm or a pseudoaneurysm formation exceeding 55 mm, >10 mm aortic diameter increase/year, endocarditis, graft infection, or severe aortic regurgitation. All decisions of reoperation were based on the individual patient's risk profile as well as local protocols and competence.

Follow-up

The protocol in all 8 centers generally consisted of a computed tomography scan of the aorta at 1 to 3 months postoperatively, then at 1 year