International Journal of Cardiology 261 (2018) 162–166

Contents lists available at ScienceDirect

International Journal of Cardiology

journal homepage: www.elsevier.com/locate/ijcard

Should the distal tears of aortic dissection be treated? The risk of distal tears after proximal repair of aortic dissection

Simeng Zhang [a,1], Yanqing Chen [a,1], Yongxue Zhang [b,1], Dongchen Shi [c], Yu Shen [a], Junmin Bao [a], Zhiqing Zhao [a], Xiang Feng [a], Rui Feng [a], Jian Zhou [a], Qingsheng Lu [a,*], Zaiping Jing [a,*]

[a] Department of Vascular Surgery, Changhai Hospital, Shanghai, China
[b] Department of General Surgery, 285th Hospital, the Chinese People's Liberation Army, Handan, China
[c] Department of Respiratory and Critical Care Medicine, Changhai Hospital, Shanghai, China

ARTICLE INFO

Article history:
Received 26 July 2017
Received in revised form 14 December 2017
Accepted 8 January 2018

Keywords:
Aortic dissection
Distal aortic enlargement
Logistic analysis
Intimal tear
Risk factor

ABSTRACT

Background: Patients with distal residual after proximal repair of aortic dissection (AD) have shown unsatisfactory long-term prognosis. However, possible mechanisms and risk factors for distal aortic segmental enlargement (DSAE) have been poorly understood.
Methods: We analyzed 962 AD patients repaired to the descending aorta between 1999 and 2014. Aortic morphological characteristics of 419 patients (including 75 DSAE and 344 non-DSAE patients) were investigated and compared. Potential risk factors associated with DSAE were explored using logistic regression analysis or natural logarithmic transformation. Logistic multi regress equations were performed to identify independent risk factors.
Results: Independent risk factors of DSAE are listed as follow: more tears in the thoracic descending aorta (odds ratio [OR], 1.65; 95% confidence interval [CI],1.24 to 2.19; P = .0005); fewer tears in the infra-renal abdominal aorta (OR, 3.00; 95% CI,2.04 to 4.55; P < .0001); closer distance of the first intimal tear to the left subclavian artery (OR, 1.51; 95% CI,1.28 to 1.69; P < .0001); larger average distance between tears (OR, 11.81; 95% CI,3.39 to 41.08; P = .0001); larger maximum distance between two tears (OR, 1.79; 95% CI,1.48 to 2.16; P < .0001), and larger area of remained tears (OR, 1.56; 95% CI, 1.38 to 1.76; P < .0001).
Conclusions: The location and size of remained tears are the key risk factors of DSAE patients. Long-segment aortic repair and aggressive exclusion of all distal tears located on the thoracic descending aorta in their initial therapy will be an optimal strategy.

© 2018 Elsevier B.V. All rights reserved.

1. Introduction

Patients with aortic dissection (AD) have been traditionally treated with endovascular or surgical repair aiming at sealing the initial entry tear, whereas the distal tears tend to be left untreated. Almost one third of the patients, however, may still suffer from aortic expansion during follow-up [1, 2]. Approximately 30%–62.5% of patients required re-intervention to the distal aorta in the following 5 to 10 years [3–7]. There were no significant difference between Stanford A and B dissections [8] in terms of long-term overall survival rate.

Previous studies have indicated that persistent patency of false lumen (FL) is strongly associated with poor prognosis because the persistent filling in the FL maintains pressurization of the thin, weak FL wall, causing aneurysmal enlargement and potentially aortic rupture, and necessitating re-intervention [8–10]. However, most studies did not exclude cases with absence of residual dissection, total false lumen thrombosis, or intramural hematomas when they analyzed both type A and B dissections, which showed a totally different story and prognosis [11–15].

Though distal aortic dilatation after proximal repair of AD requires surgical repair, and further intervention can be too invasive for some patients, there is no clear understanding in aortic enlargement after surgical repair. The risk of remaining tears of AD patients after proximal repair has not been studied. Should all the distal tears be treated? Which kind of tears are risks for AD patients? The purpose of this analysis is to evaluate the remaining tears of post-operative AD patients and to assess their risks on distal segmental aortic enlargement (DSAE). Finally, the results will order some clinical advices to treat AD.

2. Methods

2.1. Study population

From September 1999 to May 2014, a retrospective analysis of the clinical outcomes for patients with extensively involved (at least affected to the bifurcation of abdominal aorta)

* Corresponding authors at: Department of Vascular Surgery, Changhai Hospital, the First Affiliated Hospital of the Navy Military Medical University, 168 Changhai Rd, 200433 Shanghai, China.
E-mail addresses: luqs@xueguan.net (Q. Lu), jingzp@xueguan.net (Z. Jing).
[1] Simeng Zhang, Yanqing Chen and Yongxue Zhang contributed equally to this work.

https://doi.org/10.1016/j.ijcard.2018.01.028
0167-5273/© 2018 Elsevier B.V. All rights reserved.

aortic dissection, including both Stanford type A and type B, treated by proximal repair was carried on in our center. Follow-up computed tomography angiography (CTA) scans were performed 1 month, 6 months, and 1 year after surgery and annually thereafter. All patients were treated with antihypertensive agents, and their Systolic Blood Pressure (SBP) was controlled to be ≤120 mmHg. Majority of Patients here have received a follow-up that is long enough to capture complications, such as late aneurysm development and late rupture.

The study included patients that were either treated by ascending aorta and total-/hemi-arch replacement combined with elephant trunk, descending aorta replacement, total thoracic endovascular aortic repair (TEVAR), or hybrid operation. All the patients involved received a post-operative CTA and a follow-up CTA with no re-intervention for at least 1 year. The post-operative CTA scan was obtained within1 month after the intervention (baseline CTA).

Patients without remaining dissection, total FL thrombosis, penetrating aortic ulcer or intramural hematomas were excluded. Patients with type I endoleak, new entry in the proximal area or other aortic related complications in one year were excluded as well.

The clinical end points during the follow-up were the overall mortality and other presumably dissection-related events: death related to any aortic dissection complications, unexplained sudden death, and the need for further operative intervention in the aorta owing to severe complications.

The study was approved by the institutional review committee, and patients gave their permission. We defined acute dissections as presentations within two weeks from the initial event [16], sub-acute dissections as from 14 days to 2 months, and chronic phase as >2 months.

DSAE was defined as the diameter of the residual dissection more than 1.5 times of the normal aorta or the growth rate of diameter >10 mm/year.

2.2. Data collection

Clinical variables, including patient demographics and previous history, imaging results, surgical treatment such as operation method, and the length of the graft in the descending aorta, were recorded in this study.

All CTA images were performed on multislice CTA scanners with 16- or 64-detector Siemens Sensation configuration. The acquired CTA data sets were transferred to a TeraRecon Vascular 4.4.6 workstation (Aquarius iNtuition Edtion, TeraRecon, Foster City, California) in DICOM (Digital Imaging and Communications in Medicine) format for analysis.

2.3. Imaging measurement

A central vessel reconstruction in centerline protocol reconstruction (CPR) mode was obtained in all CTAs. The centerline was created from the aortic valve annulus to the distal point of external iliac artery.

FL thrombosis, remaining dissection length, and location and size of post-operative tears were evaluated in the study.

2.4. Measurement of entry

The number, location, shape and size of intimal tears connecting the TL and FL were recorded for all patients. The location of proximal tear was measured from the left subclavian artery (LSA). The maximum distance between two tears was defined as the largest distance between two adjacent tears (Fig. 1), and the average distance between tears was defined as the arithmetic average of distances between two adjacent tears. The width of a tear (WT) was measured as maximal gap in the dissection flap on reconstructed images. The length of a tear (LT) was calculated with the length of consecutive aortic-centerline images on which a tear was visible. For size comparison, the area was calculated for intimal tears as 1/2 WT*LT.

2.5. Data analysis

Clinically significant rates were reported with 95% CIs, and continuous variables were expressed as mean ± standard deviation (SD). Statistical significance was defined as probability (P) values <.05, and all P values were 2-sided. Potential risk factors associated with distal segmental aortic enlargement (DSAE) were explored using logistic regression analysis for normal distributed continuous variables, and natural logarithmic transformation for skewed distribution measurement data. Logistic multi regress equations were performed to identify independent risk factors. Generalized estimating equations (GEE) were performed when the interclass correlation exists among the variables. Results are summarized to odds ratios (OR) and 95% confidence intervals (CI). All analyses were performed with Empower (R) (www.empowerstats.com, X&Y Solutions, inc. Boston MA) and R (http://www.R-project.org).

3. Results

3.1. Follow-up information

From 1999 to 2014, there were 1703 AD patients treated in our hospital; 529 patients were excluded because of solely medicine treatment. Other 212 patients were excluded for the following reason: 54 patients had unaffected abdominal aorta, 43 type A patients were treated without thoracic descending aorta, 80 patients were died in hospital or one year after repair, and 35 patients were re-intervened within one year after first repair; 962 were analyzed in this study, and 691 patients were male. Among 962 patients, 129 patients (13.41%) had developed DSAE, and the rest had not. The mean age of patients was 52.46 years old (±12.87). The median follow-up period was 6.33 years (range from 1.5 to 17 years). The mean time of incident occurrence was 39.4 months (range from 3 to 144 months).

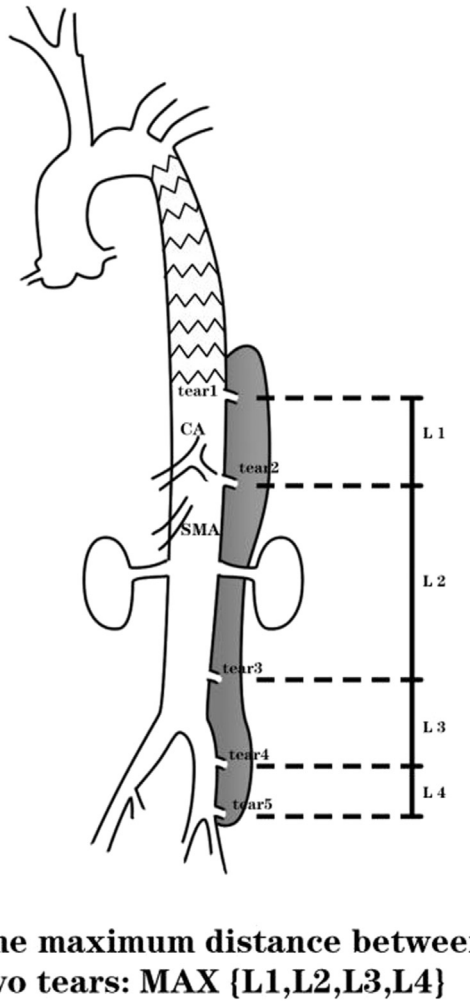

Fig. 1. Schematic diagram of the maximum distance between two tears. CA, celiac artery; SMA, superior mesenteric artery.

3.2. Distribution of remaining tears after operation

There were only 0.24% of patients who did not show any tears after repair; 99.76% remained distal tears: 4.3% patients had one tear, 9.07% had two, 6.44% had three, and 79.97% patients had more than three tears. The tears were mostly spindle shaped (72.0%).

The average number of post-operative tears was 6.10 ± 3.16, among them 1.07 ± 1.59 in thoracic descending aorta, 1.53 ± 1.27 in branched area of abdominal aorta, 1.20 ± 0.80 in the iliac artery, and 2.30 ± 1.41 in the infra-renal abdominal aorta, which has the largest number of tears.

3.3. Risk factors for DSAE

3.3.1. Clinical features

Candidate univariate logistic regression outcome of clinical characteristics are shown in Table 1. Patients with AD who developed DSAE

Download English Version:

https://daneshyari.com/en/article/8662074

Download Persian Version:

https://daneshyari.com/article/8662074

Daneshyari.com