CLINICAL STUDY

Acute Intramural Hematoma of the Descending Aorta Treated with Stent Graft Repair Is Associated with a Better Prognosis

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ABSTRACT

Purpose: To compare midterm outcomes of optimal medical treatment (OMT) alone with OMT and thoracic endovascular aortic repair (TEVAR) of acute type B intramural hematoma (IMHB).

Materials and Methods: Retrospective analysis was performed of 65 patients treated with OMT alone (31 patients) or OMT with TEVAR (34 patients) for acute uncomplicated or complicated IMHB from January 2006 to December 2015 in a single institution. Primary outcome was aortic-related mortality during follow-up. Secondary outcomes were aortic-related adverse events, all-cause mortality, and occurrence of complete aortic remodeling.

Results: Except for the morphologic nature of the aortic lesion, no significant differences in baseline characteristics between the 2 groups were observed. Mean follow-up time was 32 months ± 19 (range, 1–120 months). Patients in the OMT group had a significantly increased rate of aortic-related mortality (12.9% vs 0% in TEVAR group, $P = .046$) and aortic-related adverse events (29.0% vs 0% in TEVAR group, $P < .001$) and an insignificant but higher trending all-cause mortality rate (38.8% vs 19.8% in TEVAR group, $P = .15$). The occurrence of complete aortic remodeling was significantly lower in the OMT group (15.4% vs 82.1% in TEVAR group, $P < .001$).

Conclusions: TEVAR is likely to protect from progression of IMHB and to be associated with a better prognosis than OMT alone.

ABBREVIATIONS

IMHB = type B intramural hematoma, OMT = optimal medical therapy, TAD = total aortic diameter, TEVAR = thoracic endovascular aortic repair, TLD = true lumen diameter

In an aortic intramural hematoma, which is considered an acute aortic syndrome, hematoma formation occurs between the aortic intima and media. This condition is often described in the literature as an atypical aortic dissection because it is thought to represent either early-stage limited dissection or thrombosis of the false lumen in dissection (1,2). The natural history of acute intramural hematoma continues to be debated, especially type B intramural hematoma (IMHB) (3,4). Regression occurs in one third of patients with IMHB (5,6), but progression to classic aortic dissection and aneurysm formation has also been described (4). Recent guidelines and review articles indicate that patients with intramural hematomas involving the ascending aorta should be treated by surgery, whereas patients with uncomplicated IMHB typically should be treated medically; only in the event of complications do these patients become candidates for treatment with thoracic endovascular aortic repair (TEVAR) (6–9), which is mainly derived from studies of type B aortic dissections. However, there is considerable controversy surrounding the prognosis and long-term clinical course of patients with IMHB. A number of authors reported satisfactory results using a conservative approach to uncomplicated IMHB (10,11). However, a worse prognosis for patients with IMHB has been reported when managed only with medical treatment (12,13), making the prognosis of IMHB unpredictable. Hence, increasing numbers of patients with IMHB are being treated with TEVAR, which demonstrates marked improvement in the

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prognosis (14,15). Although, the current treatment strategy for IMHB was recommended worldwide, the occurrence of disastrous progression of IMHB treated with medical management was not a rare event in our institution. The purpose of this study was to investigate the midterm outcome of patients with complicated IMHB who were treated with TEVAR and compare with the outcome of patients with uncomplicated IMHB treated with optimal medical therapy (OMT).

MATERIALS AND METHODS

Patient Characteristics

The study protocol was reviewed and approved by the local medical ethics committee and institutional review board. This retrospective study comprised 65 patients with acute complicated or uncomplicated IMHB initially treated with TEVAR (TEVAR group, n = 34 patients) or OMT (OMT group, n = 31 patients) in a single institution between January 2006 and December 2015. Patients' records were reviewed for demographic characteristics, concomitant diseases, morphologic nature of the aortic lesion, indications for stent graft repair, medical treatment strategy, and follow-up outcomes. No significant differences between the 2 groups were observed in terms of age, sex, body mass index, comorbidities, or extension of the hematoma (**Table 1**). IMHB was defined by unenhanced and contrast-enhanced computed tomography (CT) as a circular or crescent-shaped thickening of > 5 mm in the descending aortic wall without a demonstrable intimal flap on imaging study or an obvious radiologic intimal tear (16). The CT assessment was obtained within 24 hours of symptom onset. The acute stage was confined to the initial 2 weeks after symptom onset. Patients in the stent graft repair group provided informed consent to undergo the procedures listed. Reporting standards for TEVAR were based on the Society of Vascular Surgery guidelines (17).

Table 1. Clinical Characteristics and Imaging Results of Patients

Variables	TEVAR Group (n = 34)	OMT Group (n = 31)	*P* Value
General information			
Male sex	27 (79.4)	22 (71.0)	.57
Age, y	64.5 ± 11.2 (37–75)	61.2 ± 9.7 (44–68)	.21
BMI	23.6 ± 4.5 (19–36)	24.1 ± 3.8 (20–33)	.63
Hospital length of stay, d	21 ± 7 (7–53)	19 ± 8 (15–46)	.29
Symptom			
Chest pain	26 (76.5)	19 (61.3)	.28
Back pain	25 (73.5)	17 (54.8)	.13
Abdominal pain	8 (23.6)	9 (29.0)	.78
Concomitant disease			
Hypertension	28 (82.4)	23 (74.2)	.55
Atherosclerosis	14 (41.2)	11 (35.5)	.80
Smoking	25 (73.5)	24 (77.4)	.78
Chronic renal failure	3 (8.8)	1 (3.2)	.61
COPD	7 (20.6)	5 (16.1)	.75
Diabetes mellitus	3 (8.8)	4 (12.9)	.70
Anatomy			
Thickness of hematoma, mm	16.6 ± 4 (11–24)	8.3 ± 2 (6–10)	< .001
TAD, mm	39.1 ± 7 (27–58)	34.4 ± 5 (25–42)	.003
TLD, mm	22.5 ± 5 (9–32)	25.7 ± 4 (14–29)	.006
Location			
Proximal sites			
Zone 2	1 (2.9)	0 (0)	—
Zone 3	30 (88.2)	28 (90.3)	—
Zone 4	3 (8.8)	3 (9.7)	—
Distal sites			
Zone 4	7 (20.6)	4 (12.9)	.52
Zone 5	21 (61.8)	19 (61.3)	—
Extend to abdominal aorta	6 (17.6)	8 (25.8)	.55

Note–Continuous data are presented as mean ± SD (range), and categorical data are presented as number (%).
BMI = body mass index; COPD = chronic obstructive pulmonary disease; OMT = optimal medical treatment; TAD = total aortic diameter; TEVAR = thoracic endovascular aortic repair; TLD = true lumen diameter.