

# Off label treatment of intraabdominal dissection with iliac stent graft extension. A case report

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## SOUHRN

K disekci aorty omezené na abdominální aortu dochází poměrně vzácně; představuje pouhých 1–4 % všech případů disekce aorty. Pokud se týče optimální léčby symptomatické izolované disekce abdominální aorty (isolated abdominal aortic dissection, IAAD), je k dispozici málo důkazů. Dvěma hlavními intervenčními metodami jsou otevřená operace a endovaskulární přístup. Léčba onemocnění aorty – v nepřítomnosti aneurysmatu – klasickými stentgraftovými systémy je vzhledem ke „konkurenci“ jejích jednotlivých větví ve zúženém distálním segmentu aorty náročná. Tato kazuistika popisuje naše klinické zkušenosti s off-label (mimo schválené indikace) endovaskulární léčbou asymptomatické disekce infrarenální části aorty doprovázené těžkou aterosklerózou aorty. U pacientky byla indikována katetrizační implantace aortální chlopně (transcatheter aortic valve implantation, TAVI) a pro zajištění potřebného přístupu pro výkon byla prodloužena větev aortálního endograftu.

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## ABSTRACT

Aortic dissection limited to the abdominal aorta is an uncommon condition, accounting for only 1% to 4% of all aortic dissections. There is limited evidence on the optimal management of symptomatic isolated abdominal aortic dissections (IAAD). The two primary interventional methods are open surgery and the endovascular approach. Treating nonaneurysmal aortic disease is challenging with conventional stent-graft systems due to limb competition in a narrow distal aorta. This case report describes our clinical experience with an off-label endovascular treatment for an asymptomatic infrarenal aortic dissection, accompanied by severe aortic atherosclerosis, in a female patient. The patient was scheduled for a transcatheter aortic valve implantation (TAVI) procedure, and an aortic endograft limb extension was used to ensure an adequate pathway for the procedure.

## Introduction

Aortic dissection limited to the abdominal aorta is an uncommon clinical condition, accounting for only 1% to 4% of all aortic dissections.<sup>1,2</sup> The causes of isolated abdominal aortic dissection (IAAD) can be spontaneous, traumatic, or iatrogenic. Most affected individuals are men, with a median age of 60 years, and they often present with high blood pressure.<sup>3</sup> The disease can present either acutely with a sudden onset of symptoms or chronically, with symptoms appearing 14 days after onset.<sup>3</sup> Due to its rarity, documented mostly through case reports and small case series, the natural history and

treatment options for IAAD are not well understood. The most common symptom is abdominal or back pain, while claudication and lower limb ischemia are rare.<sup>2</sup> Asymptomatic cases with a non-dilated aorta are usually managed conservatively, whereas symptomatic cases are treated with either open or endovascular repair, depending on anatomical considerations and the surgeon's expertise. This case report discusses the management of an asymptomatic infrarenal aortic dissection, combined with severe aortic atherosclerosis in a female patient, who was scheduled for a transcatheter aortic valve implantation (TAVI) procedure to ensure an adequate pathway for the procedure.

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## Case report

A 78-year-old female patient was admitted to the cardiology department due to worsening chronic heart failure. Her medical history included severe aortic valve stenosis, aortic and mitral valve regurgitation, persistent atrial fibrillation, dyslipidemia, and hypertension. A cardiac CT scan was performed, and the patient was scheduled for TAVI. However, CT angiography of the distal vessels revealed a severely diseased infrarenal abdominal aorta with a stenotic and severely dissected lumen (**Fig. 1**), which was asymptomatic. Performing TAVI in this compromised abdominal aorta posed a risk of worsening the dissection, causing distal embolization, or resulting in aortic rupture. To create a suitable pathway for the TAVI procedure, an off-label iliac extension stent graft 16/82mm (Endurant Medtronic) was placed in the dise-

ased infrarenal aorta. The final result was excellent, with no complications and normal flow of the contrast agent (**Fig. 2**). A CT scan one month later confirmed a patent stent graft with no residual stenosis (**Fig. 3**). Moreover, the patient underwent TAVI procedure three months after, with no complications.

## Discussion

Aortic dissection confined to the abdominal aorta is an uncommon condition, accounting for only 1% to 4% of all aortic dissections.<sup>1-3</sup> The existing literature offers limited guidance on the optimal treatment approach, primarily consisting of small patient series. In 2009, Jonker et al.<sup>4</sup> conducted a review and meta-analysis of clinical data involving 92 patients with isolated abdominal aortic

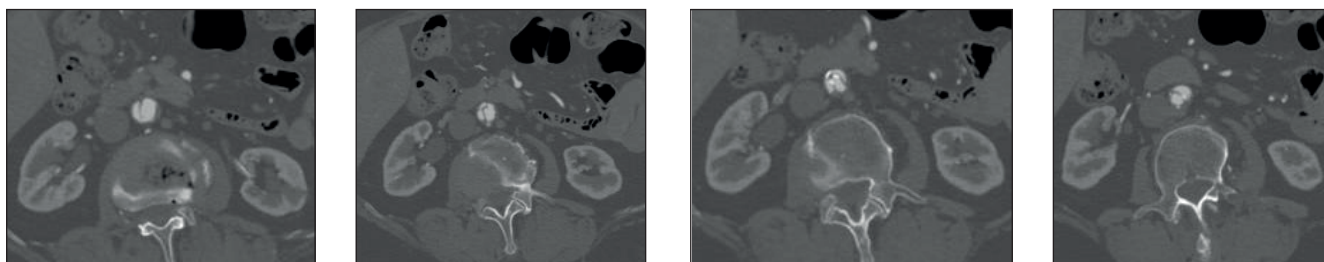


Fig. 1 – Dissection of infrarenal aorta

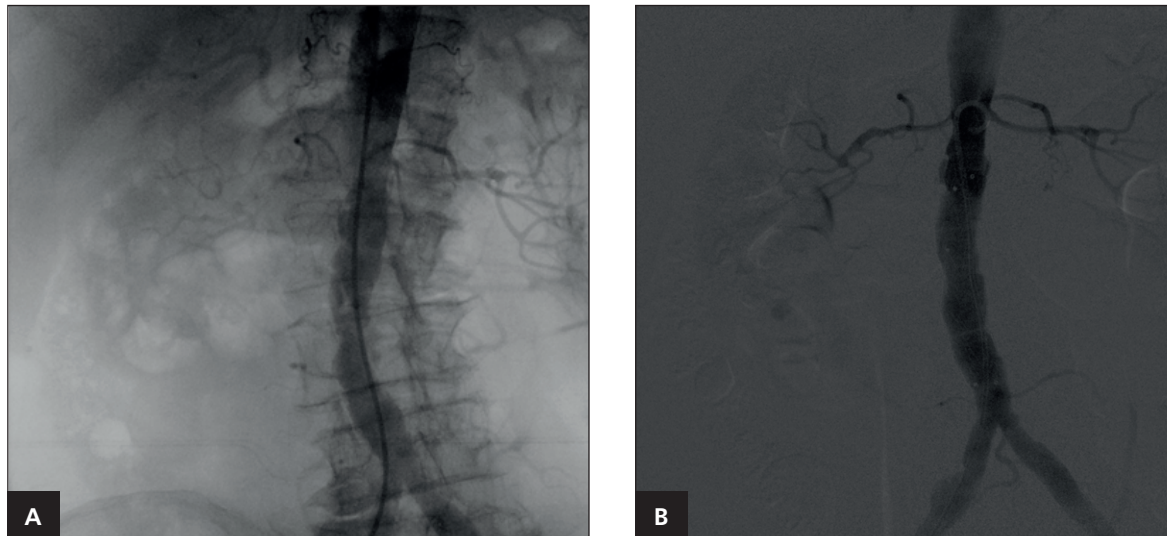


Fig. 2 – (A) Initial angiogram showing and ulcerated and dissected abdominal aorta. (B) Excellent result after covered stent placement.

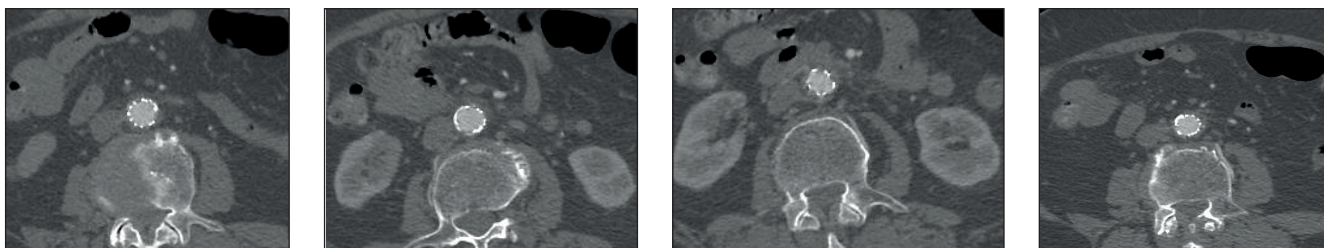


Fig. 3 – CT scan after stent placement showing no residual stenosis.

dissections. Most of these patients received conservative treatment or underwent traditional surgical procedures, with only 19 (21%) undergoing endovascular repair using a variety of stents, stent-grafts, and balloons. Due to the heterogeneity of the cases, short-term follow-up, and the small number of patients treated, no definitive conclusions could be drawn regarding the best therapeutic strategy for these dissections.

In a more recent study, Jawadi et al.<sup>5</sup> presented the long-term outcomes of 21 patients (18 men; mean age 72  $\pm$  18 years, range 34–90) with IAAD who underwent endovascular treatment between January 2000 and December 2012. Fourteen patients had spontaneous abdominal dissections, while 7 had iatrogenic dissections. The average dissection length was 45  $\pm$  12 mm (range 18–98). Ten patients received tube stent-grafts, 9 had bifurcated endografts, one received an aorto-uni-iliac (AUI) endoprosthesis, and one was treated with a bare metal stent. All patients achieved complete aortic remodeling over a 12-year period. The study found no mortality, few complications, and a rare need for secondary interventions with endovascular IAAD treatment.

Surgical treatment of IAAD typically carries a significant risk of in-hospital mortality (4%) and complications (9%).<sup>4</sup> In a meta-analysis by Jonker et al. surgery was chosen as the treatment option for 50% of the 92 patients analyzed. Among them, one patient (2.2%) died during the hospital stay, and six patients (13%) experienced complications such as neurological issues in the lower limbs (n = 4), bleeding (n = 1), or renal failure (n = 1). In contrast, endovascular techniques offer a less invasive approach to IAAD treatment with minimal or no mortality and a low complication rate.<sup>4</sup> Based on our clinical experience with aortic wall lesions, including PAUs, intramural hematomas, and dissecting saccular aneurysms, we advocate for an early and aggressive approach to treating these conditions, given the progressive degeneration of the aortic wall that can ultimately lead to rupture.

There are no definitive guidelines favoring one type of endovascular device over another. If there is no thrombus formation in the true lumen, the risk of peripheral embolization is minimal. In such cases, bare metal stents can be considered the first choice to maintain perfusion in collateral pathways and lumbar arteries. However, if there is a risk of peripheral embolization or a co-existing abdominal aortic aneurysm (AAA), stent-grafts are recommended. In the case presented, although there was no evidence of aortic intraluminal thrombus, the heavily calcified dissected lesion posed a high risk of aortic rupture, particularly during post-dilatation aimed at increasing the luminal diameter. For this reason, we opted for a cov-

ered stent (balloon expandable) or stent-graft. Before stent placement, we were uncertain about the potential residual stenosis we might encounter, which led us to choose a self-expandable stent-graft for better alignment with the vessel wall. After the initial stent implantation, a high-grade stenosis was observed, which we treated with aggressive balloon post-dilatation to achieve better lumen expansion. The outcome was excellent, with minimal risk of aortic leakage.

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## Conclusion

Endovascular treatment of IAADs appears to be a safe approach, delivering lasting results over the long term. The procedure's minimally invasive nature is linked to significant clinical advantages, particularly in reducing mortality and morbidity. In this clinical case, we successfully achieved complete aortic remodeling using an off-label application of an iliac endograft limb extension in the aortic position, without encountering any peri- or post-procedural complications. Moreover, we secured a pathway for a future TAVI procedure which yielded excellent results with no complications.

## Conflict of interest

The authors declare no conflict of interest.

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## Ethical statement

## Informed consent

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