Case Report: Combined procedure of heart transplantation and ascending aorta replacement

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Introduction:

<1% of patients with end-stage heart failure present an ascending aorta aneurysm (AAA).

- More common within the Marfan Syndrome population.

43% of patients with Marfan Syndrome and end-stage heart failure are placed on the cardiac transplant list.

- 6 documented cases in which the combined procedure of cardiac transplantation and ascending aorta replacement was performed in patients with end-stage heart failure and AAA due to Marfan Syndrome.
- Only 2 documented cases in which this procedure was performed in patients diagnosed with AAA, not related to Marfan Syndrome. Both cases replaced the ascending aorta with a synthetic graft.

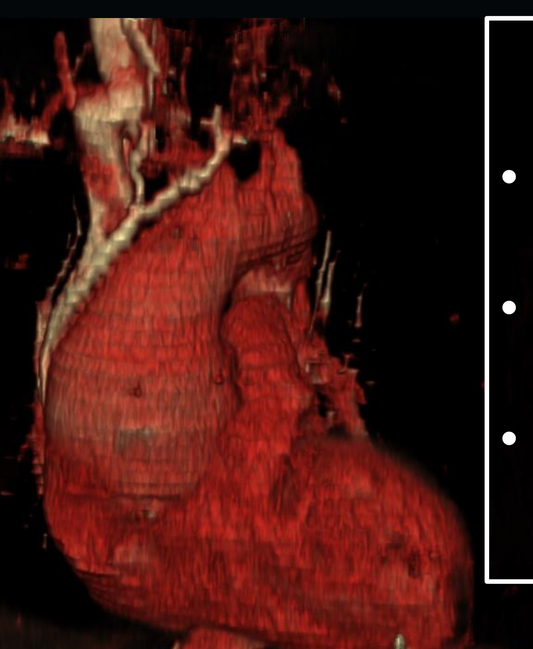
We report the case of a 70-year-old male, with an AAA and end-stage heart failure, submitted for combined procedure of cardiac transplantation and ascending aorta replacement **using the donor's heart and ascending aorta en-bloc**.

Case Report:

The patient is a 70-year-old male with a past medical history of systemic arterial hypertension and advanced heart failure.

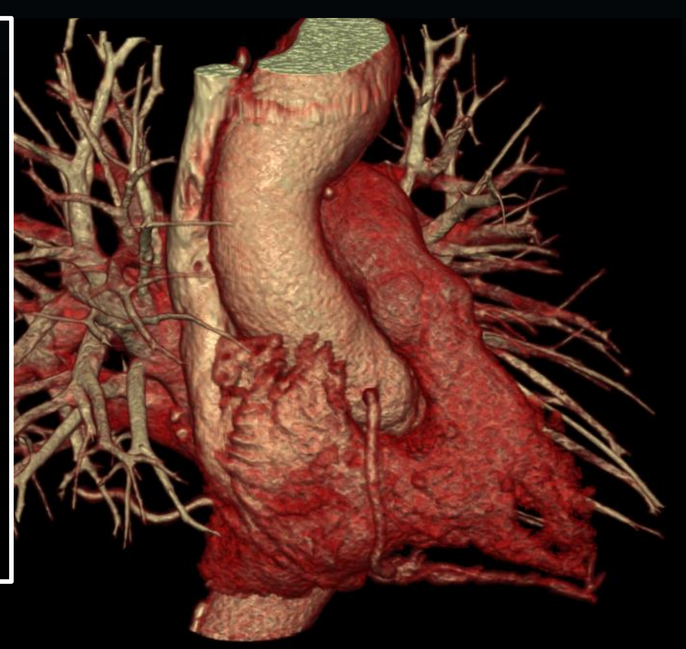
- 2001 – Aortic valve replacement with mechanical prosthesis due to aortic regurgitation.
- 2010 – presented dyspnea, orthopnea, and paroxysmal nocturnal dyspnea: class III of the NYHA with no chest pain or syncope.
- Ascending aorta dilation detected with a maximum diameter of 7 cm, due to aortic valvulopathy.
- Symptoms presented would not benefit exclusively from an ascending aorta replacement → Combined procedure.
- The entire donor's ascending aorta with part of the aortic arch was harvested.
- Cardiac transplantation was performed using the bi-caval technique.
- Aorta distal anastomosis was done at the origin of the aortic arch.
- Three years after the surgery the patient remains at a class I of the NYHA

	Our case	Rudez [6]	Kocher 1 [1]	Kocher 2 [1]	Chu [8]	Rajagopal [4]	Kirali [3]	Wei [5]
Age (years)	**70**	60	59	42	21	24	37	31
Sex	**Male**	Male	Male	Female	Male	Male	Male	Female
Marfan Syndrome	**No**	No	No	Yes	Yes	Yes	Yes	Yes
Patient Medical History	**Severe aortic regurgitation, valve replacement in 2001.**	Atrial fibrillation, aortic valve stenosis	Aortic regurgitation due to rheumatic endomyocarditis (1983). AICD implantation.	-	-	Mitral valve repair (age13), aortic root replacement and aortic dissection (age20)	Moderate mitral regurgitation, AICD implantation due to ventricular fibrillation (2006)	Bentall's operation type A AD (2001)
Current Condition	**Severe ventricular dysfunction (orthopnea)** **NYHA III**	Congestive heart failure	Aortic aneurysm and congestive heart failure.	Acute symptoms of cardiac failure, aortic regurgitation and ventricular dilation. Aortic Aneurysm NYHA IV	Dilated cardiomyopathy with dissecting ascending aorta NYHA IV.	Congestive heart failure with dissecting ascending aorta. NYHA III	Palpitations, dyspnea, chest pain. End-stage cardiomyopathy	Anterior chest pain, dissecting ascending aorta.
Aneurysm Dissection	**No**	No	No	No	Yes	Yes	No	Yes
Aneurysm Diameter (mm)	**70**	65	65	80	75	67	44 (prophylactic)	-
Ischemic Time (min)	**230**	138	296	-	150	-	145	-
Aorta replaced with:	**Donor aorta**	Tube graft	Tube graft	Donor aorta	Tube graft	Tube graft	Tube graft	Vascular graft



Conclusions:

- This combined procedure is a reproducible and straightforward technique.
- Using the donor's ascending aorta reduces the number of anastomosis and is more cost-effective.
- Combined approach should be considered for patients with an ascending aorta aneurysm of any etiology.



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