Aortic Type B Dissection - How to promote False Lumen Thrombosis

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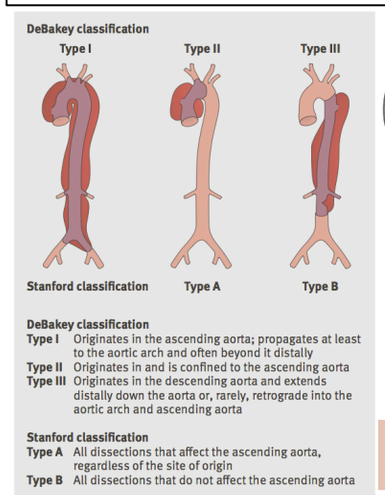
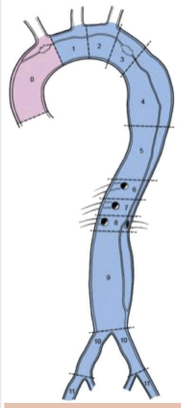
ISET International Symposium on Endovascular Therapy

Introduction:

An aortic dissection is a serious condition in which a tear occurs in the inner layer of the aorta. Blood rushes through the tear, causing the inner and middle layers of the aorta to split. Depending on the site of the entry tear and the extension of the dissection there are different classifications which influence therapeutic decision.

If the ascending Aorta is involved in general immediate surgery is indicated while in dissections originating in the descending aorta.



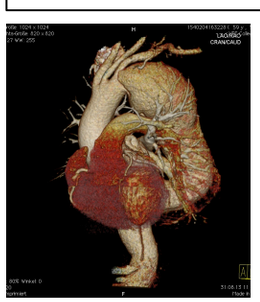


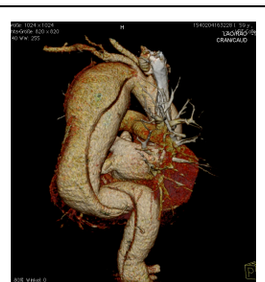
Type	Proximal Extent	Distal Extent
A_D Entry tear: Zone 0	0	0
	1	1
	2	2
	3	3
	4	4
B_{PD} Entry tear: ≥Zone 1	5	5
	6	6
	7	7
	8	8
	9	9
I_D Unidentified entry tear involving Zone 0	10	10
	11	11
	12	12

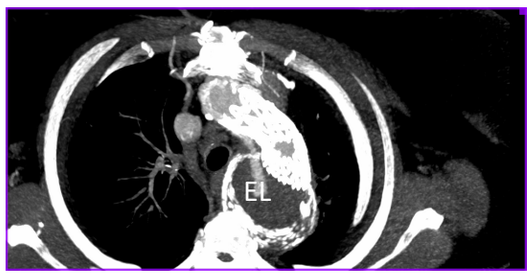
Fig 7. Society for Vascular Surgery/Society of Thoracic Surgeons (SVS/STS) Aortic Dissection Classification System.

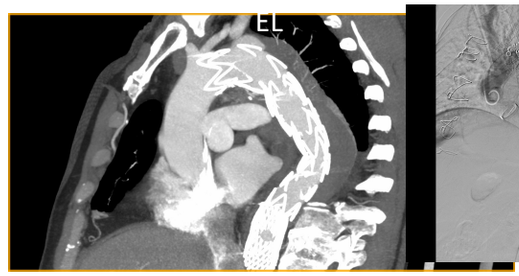
In complicated Type B Dissection there is indication for surgery primarily done with TEVAR. As identifying risk factors for later complications like aneurysmal formation or late rupture the indications for TEVAR is now more liberal.

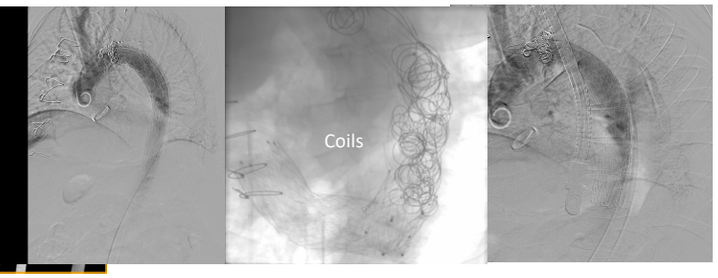
The aim of the therapy is to close the proximal entry tear, restore perfusion and protect aneurysm formation and rupture. As a perfused false lumen is a risk factor for late complications the complete thrombosis of the false lumen is one goal of the treatment.

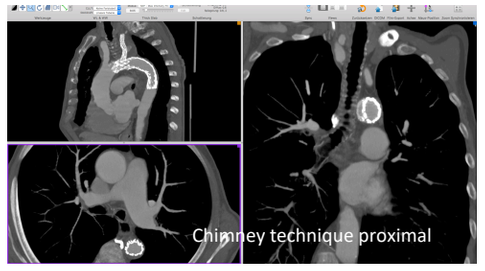


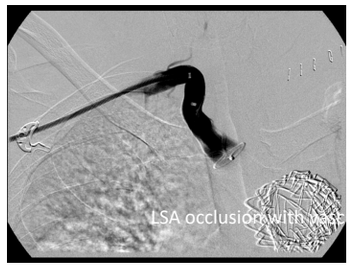


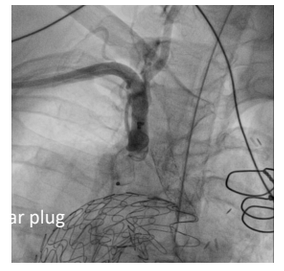




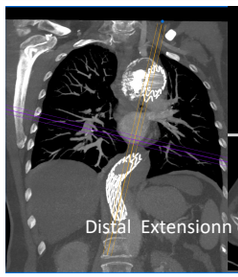


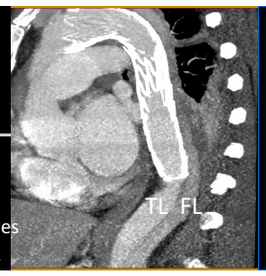


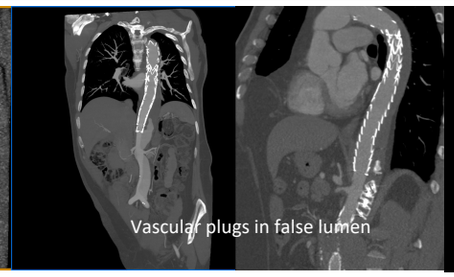


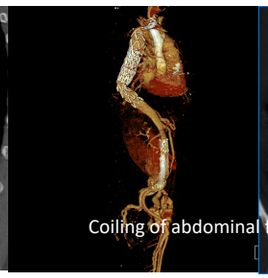


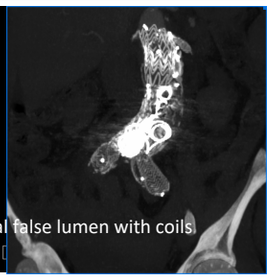
Proximal "Endoleak": Proximal perfusion to false lumen (Endoleak) may come either beside the TEVAR graft or by the left subclavian via the proximal entry to the false lumen. We coil via the false lumen or use chimney technique for the LSA or occlude the overstented LSA with a vascular plug.



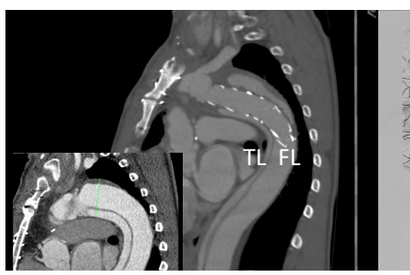


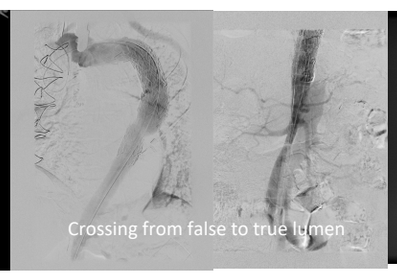


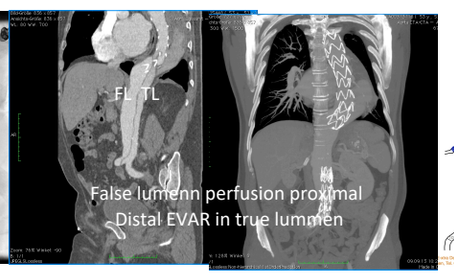


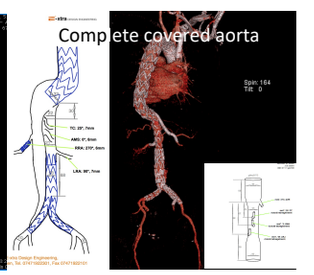


Distal "Endoleak": Distal perfusion of the false lumen (endoleak) can be treated by distal extension of the TEVAR to cover reentries. Retrograde flow can be occluded by coils and plugs. Sometimes distal infrarenal additional EVAR is necessary and remaining abdominal perfusion of the FL can be treated with coils and plugs. If visceral branches are involved the can be connected with covered stents (no image).









Complications: Sometimes the graft ends unintentional in the false lumen. By penetrating the dissection membrane or using reentry we cross back to the true lumen. If necessary we have to cover the branched aortic segment with branched grafts

Results and Discussion: In Type B dissections TEVAR is used to close the proximal entry tear and restore perfusion. In most cases there remains still partial perfusion of the false lumen, to prevent late complications we try to achieve complete thrombosis of the false lumen. Mostly the requires multiple interventions with different techniques. As there are with so called knickerbocker or candy plug technique specially designed stent grafts we can even use standard vascular plugs and volume coils or glue to achieve false lumen thrombosis. But regular controls will still be necessary to prevent late complications.