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Pulmonary vein morphology in patients undergoing catheter ablation of atrial fibrillation

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Introduction



Pulmonary veins

- Role in the initiation and maintenance of atrial fibrillation
- Isolation - a cornerstone of catheter ablation of atrial fibrillation
- Knowledge and understanding of anatomy → optimisation of ablation process

Methods



Patient group

Patients who underwent catheter ablation of atrial fibrillation

- CTA examination prior the procedure

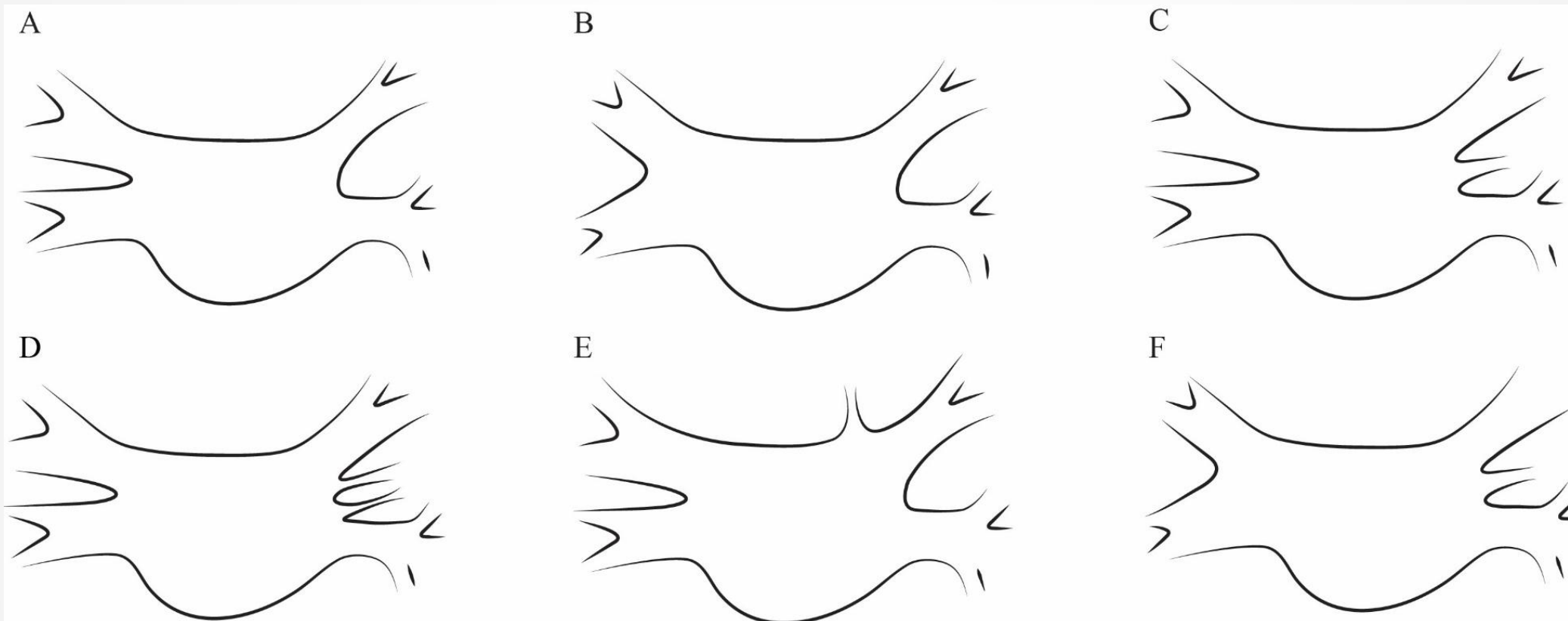
	Males	Females	Total
N	548	223	771
Age	57,2±10,8	60,8±10,8	58,4±10,7

Evaluation

Anatomy was assessed from 3D models

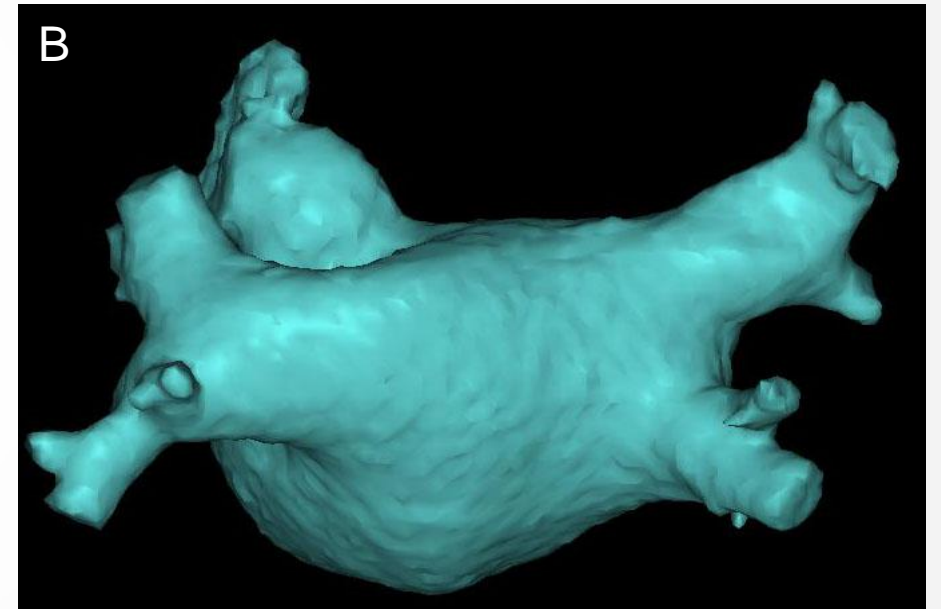
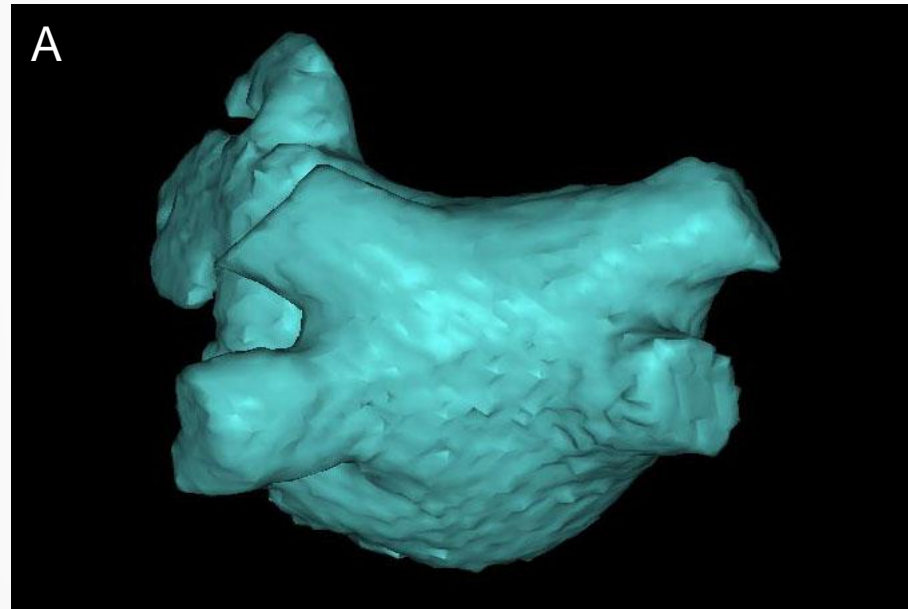
- Presence of common ostium and accessory vein

Branching pattern

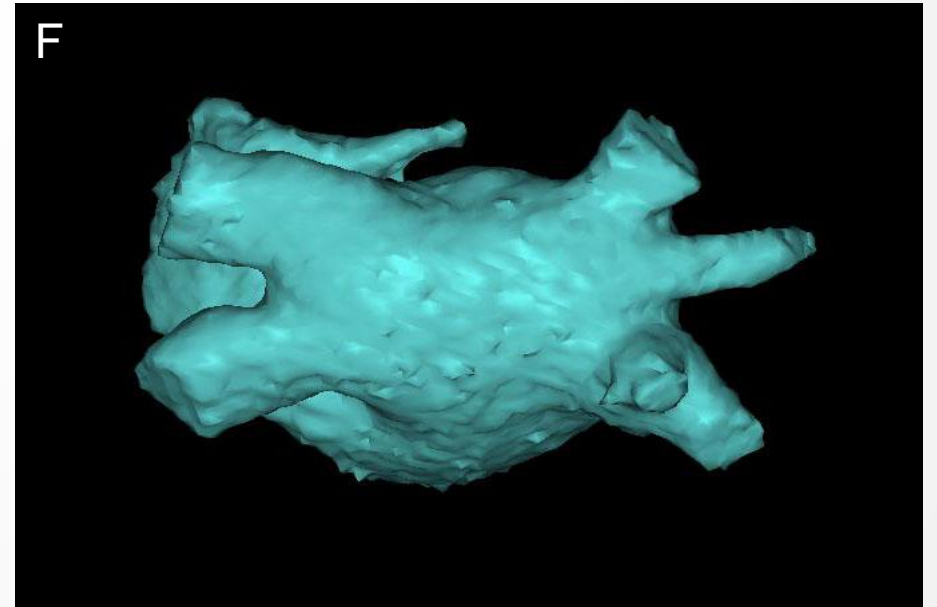
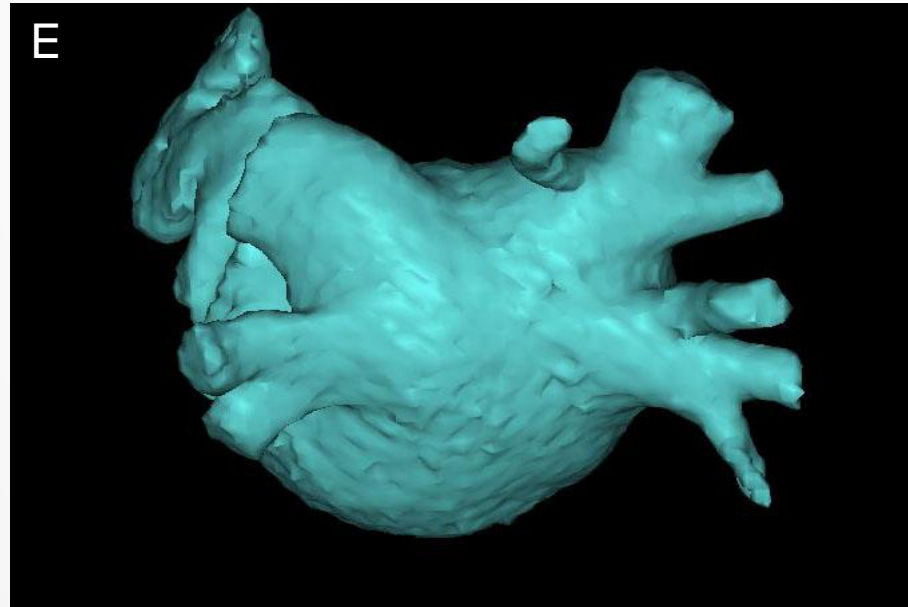
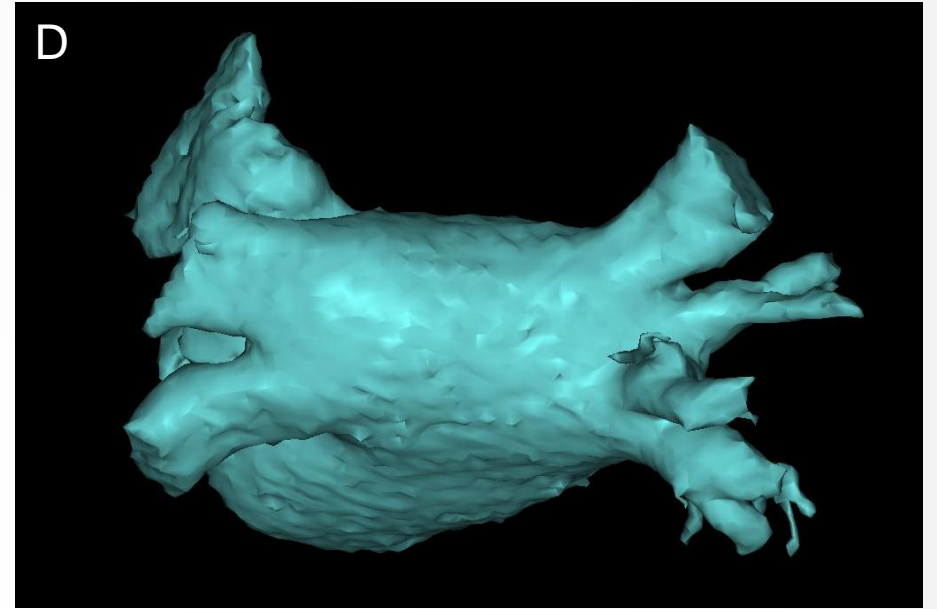
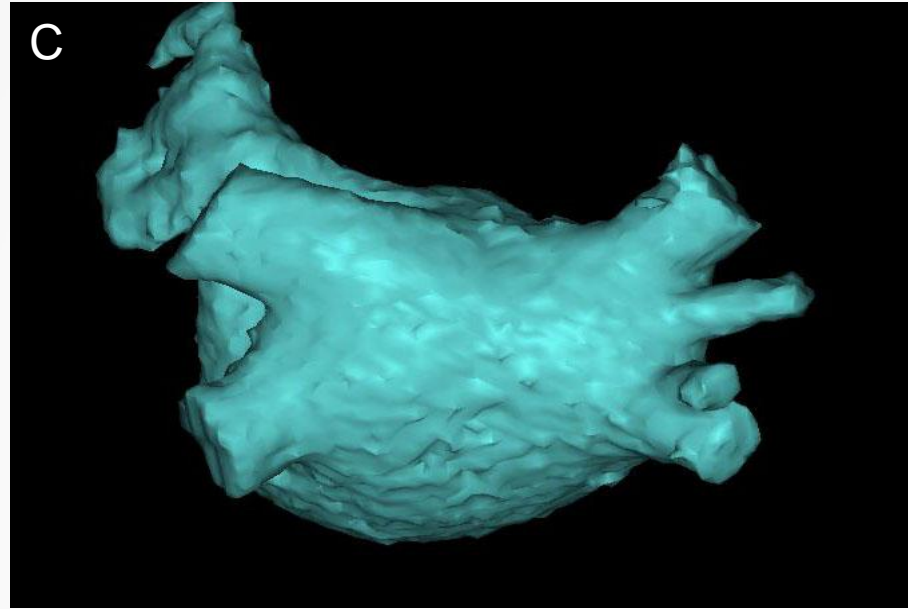


Adapted from Kato et al.

Examples of real anatomical variants



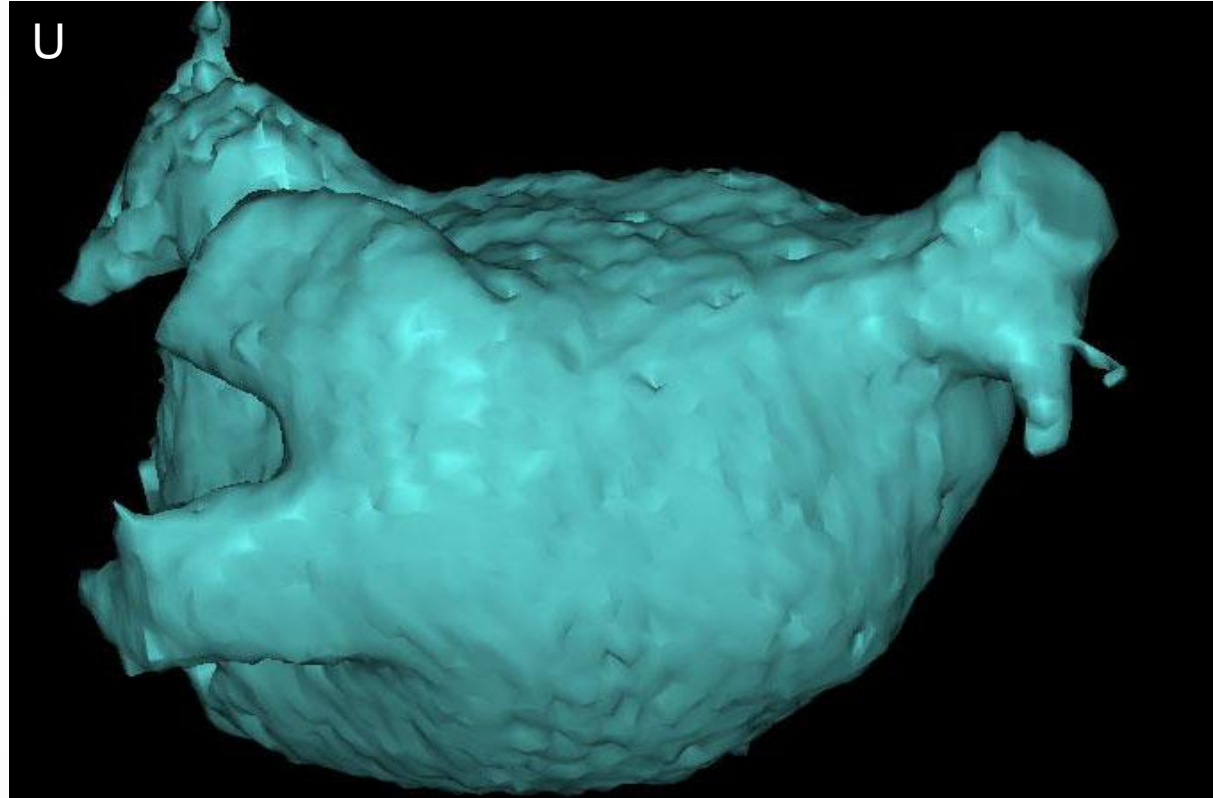
Examples of real anatomical variants



Examples of real anatomical variants

A

B



Results



N = 771

	Total		Males		Females	
	N	%	N	%	N	%
A – Typical anatomical variant	268	34,8	200	36,5	68	30,5
B – Left common ostium (LCO)	339	44	243	44,3	96	43
C – Right middle accessory vein	30	3,9	21	3,8	9	4
D – Two right middle accessory veins	11	1,4	7	1,3	4	1,8
E – Right upper accessory vein	4	0,5	3	0,5	1	0,5
F – LCO + right middle accessory vein	75	9,7	50	9,1	25	11,2
U – Unclassifiable	44	5,7	24	4,4	20	9



A number of studies on this topic

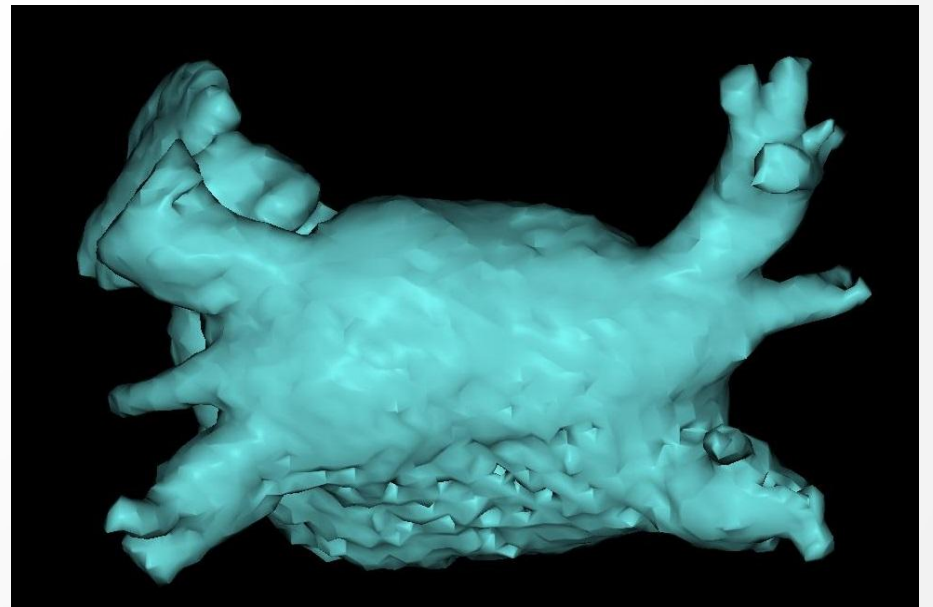
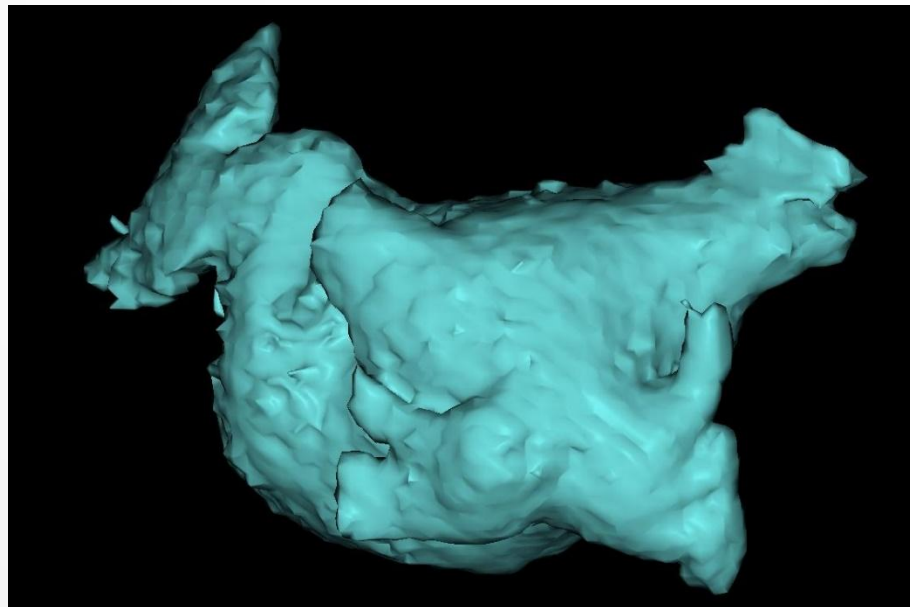
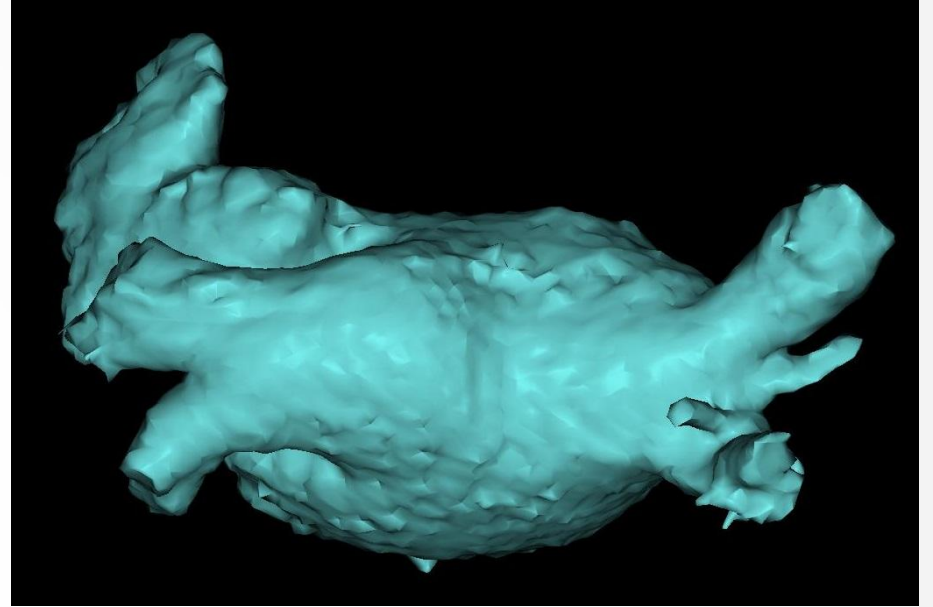
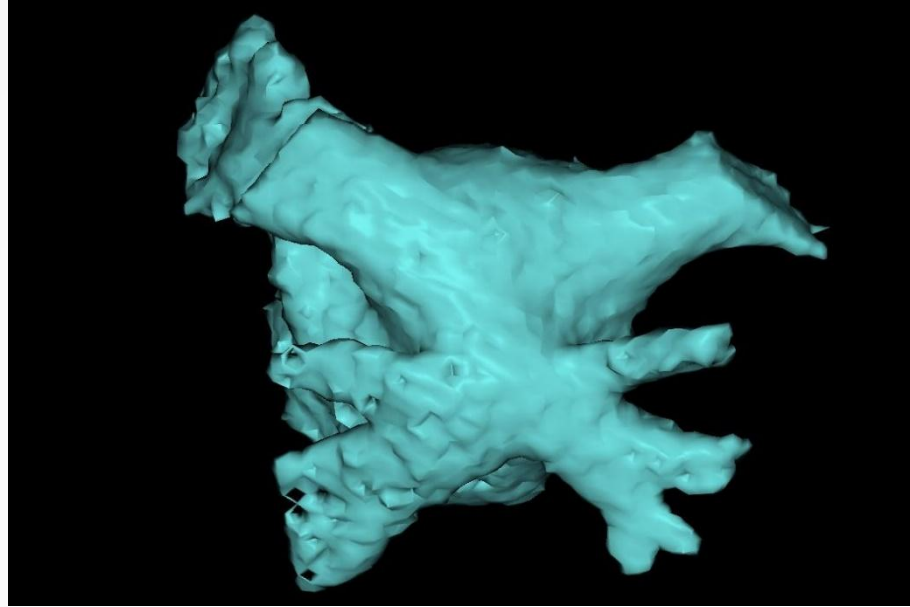
- Large differences in the size of the patient groups
 - Low incidence variants may not be included
- Different evaluation methodologies – branching patterns, 2D vs 3D
 - 3D prevalence of common left ostium
- No evaluation of differences between males and females

Conclusions

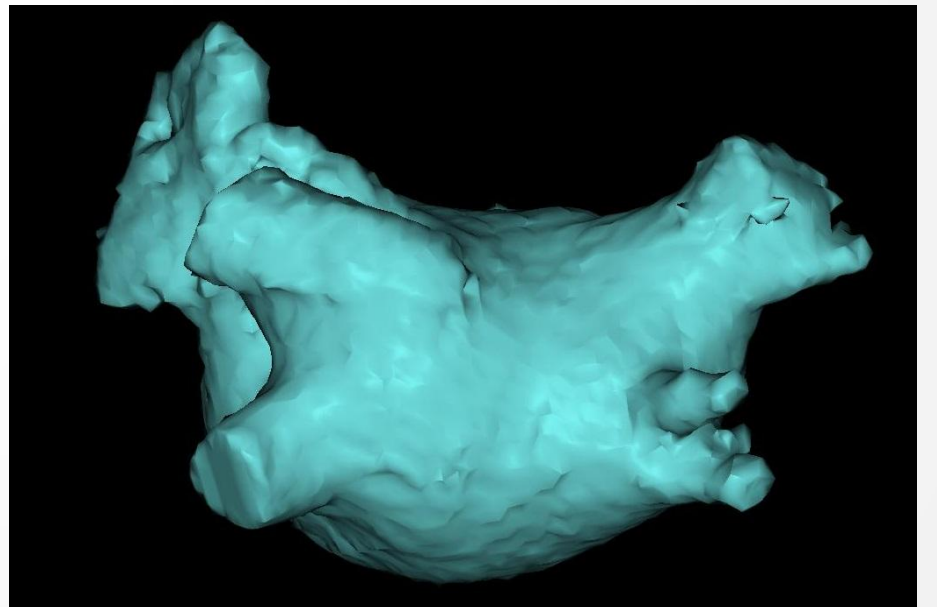
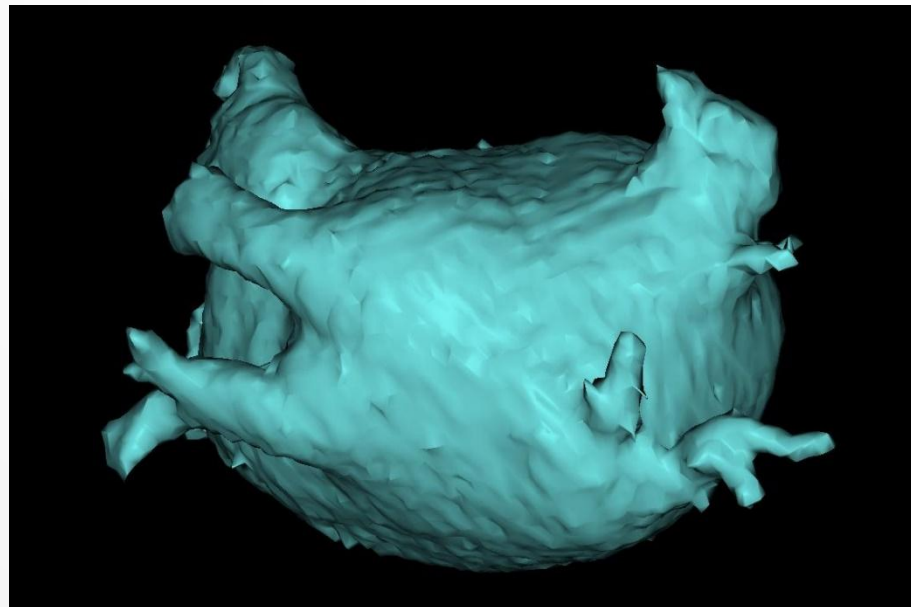
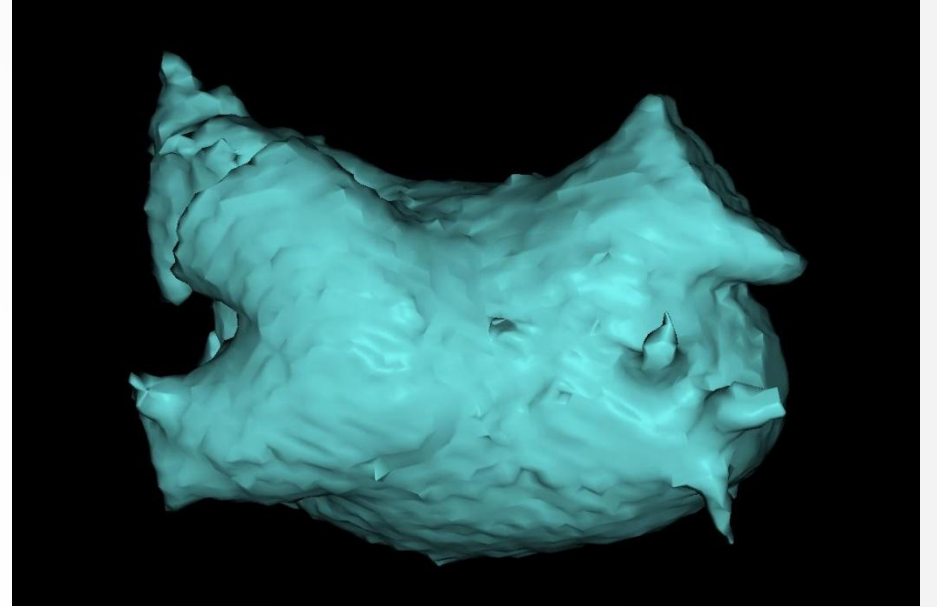
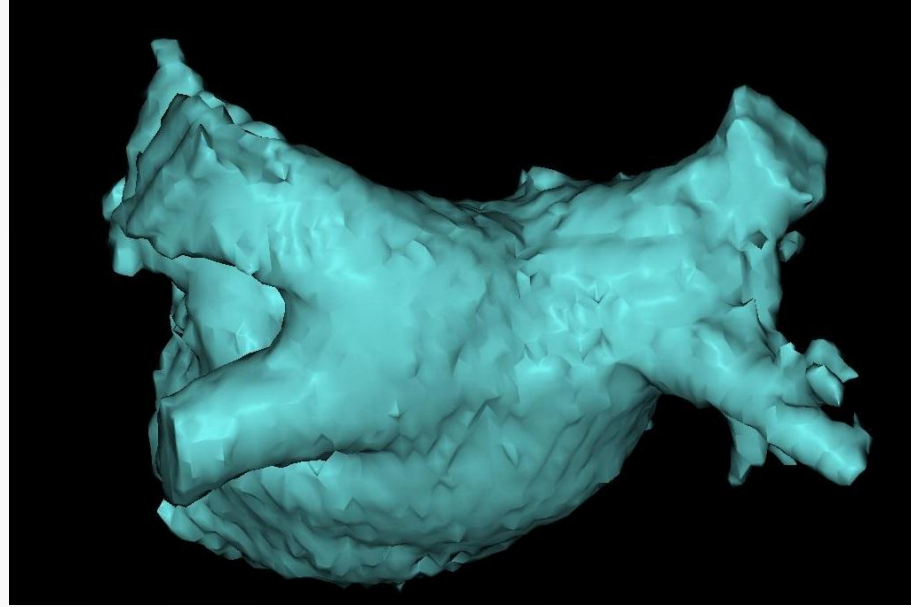


- The configuration referred to as typical is not the most common variant - the most prevalent is common left ostium
- The distribution of individual variants for females and males is comparable except for variant U (4.4% vs 9%)
- Understanding anatomical variations can contribute to the development methods and more flexible instrumentation

U-category representatives



U-category representatives



References



Kato R, Lickfett L, Meininger G, Dickfeld T, Wu R, Juang G, et al. Pulmonary vein anatomy in patients undergoing catheter ablation of atrial fibrillation: Lessons learned by use of magnetic resonance imaging. *Circulation*. 2003;107(15):2004–10.



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Thank you for attention

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