

# Pectus excavatum in motion: dynamic evaluation using real- time MRI

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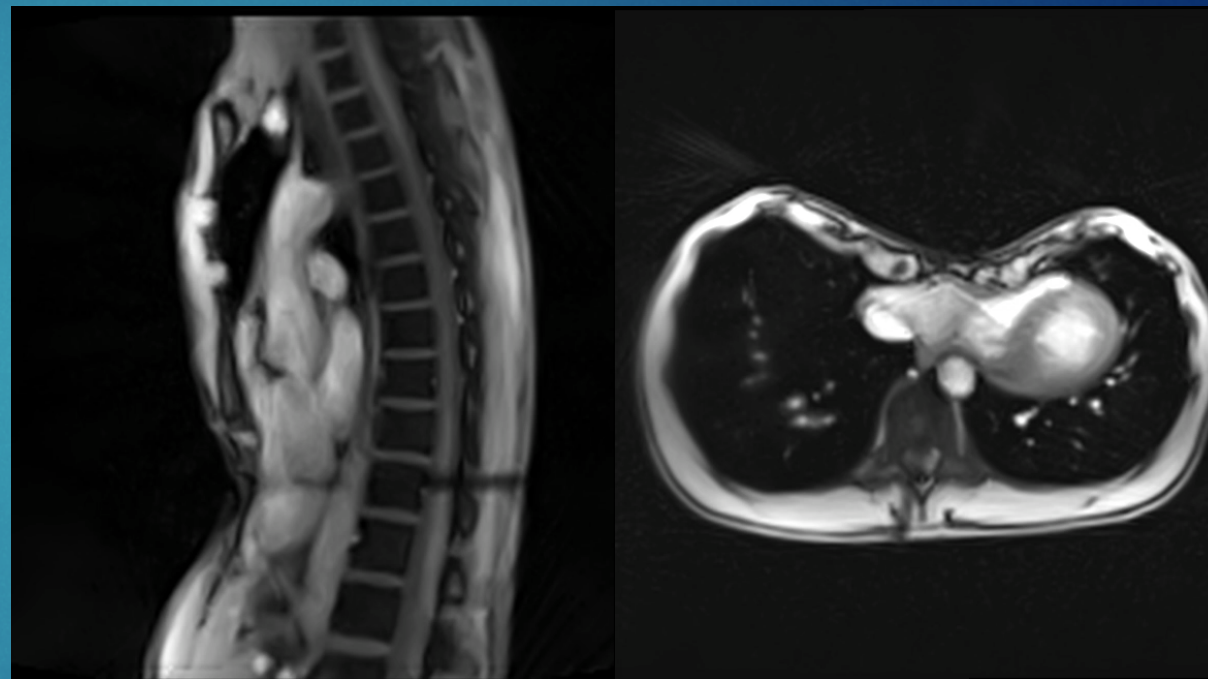
# Introduction

- ▶ Pectus excavatum (PE) very prevalent (1:400 to 1:1000)
- ▶ Morphologic assessment for therapy planning
- ▶ Cross-sectional imaging necessary
- ▶ Thoracic morphology highly dynamic
- ▶ Conventional MRI and CT highly static
- ▶ Aim: Real-Time MRI in free breathing for evaluation of PE



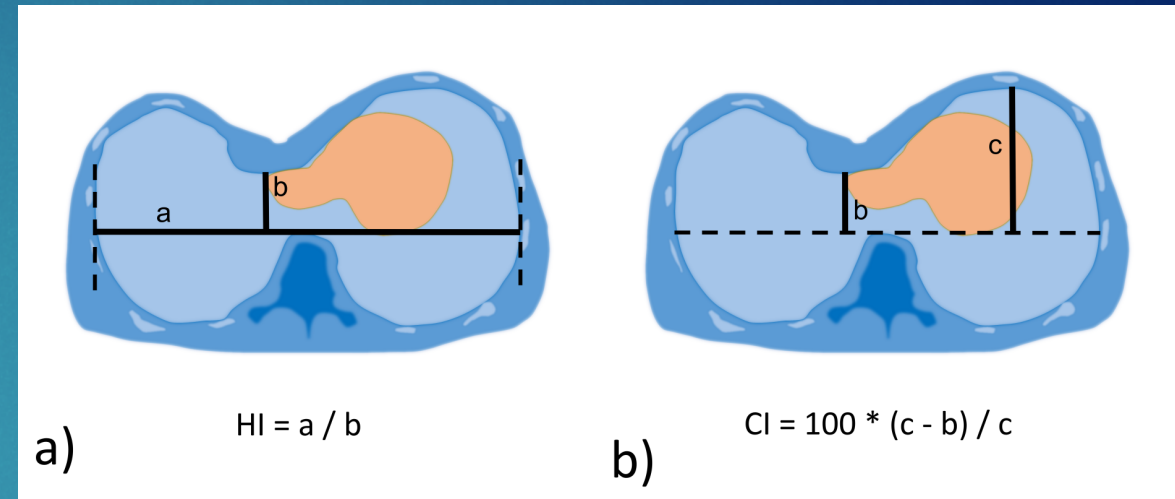
# Methods

- ▶ Prospective single center study
- ▶ 3T MRI with FLASH 2 Real-Time technology
  - ▶ Axial and sagittal plane
  - ▶ Simultaneous imaging
  - ▶ Temporal resolution 30 fps



# Methods

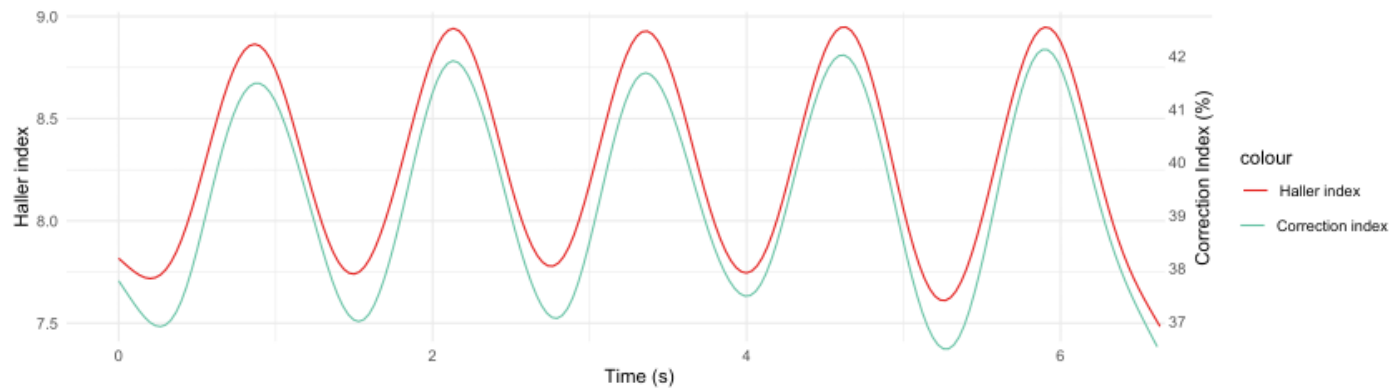
- ▶ Indices in free breathing
  - ▶ Normal breathing and deep breathing
  - ▶ Haller index and Correction index
  - ▶ Indices at different breathing states
- ▶ Motion tracking of chest wall





# Results

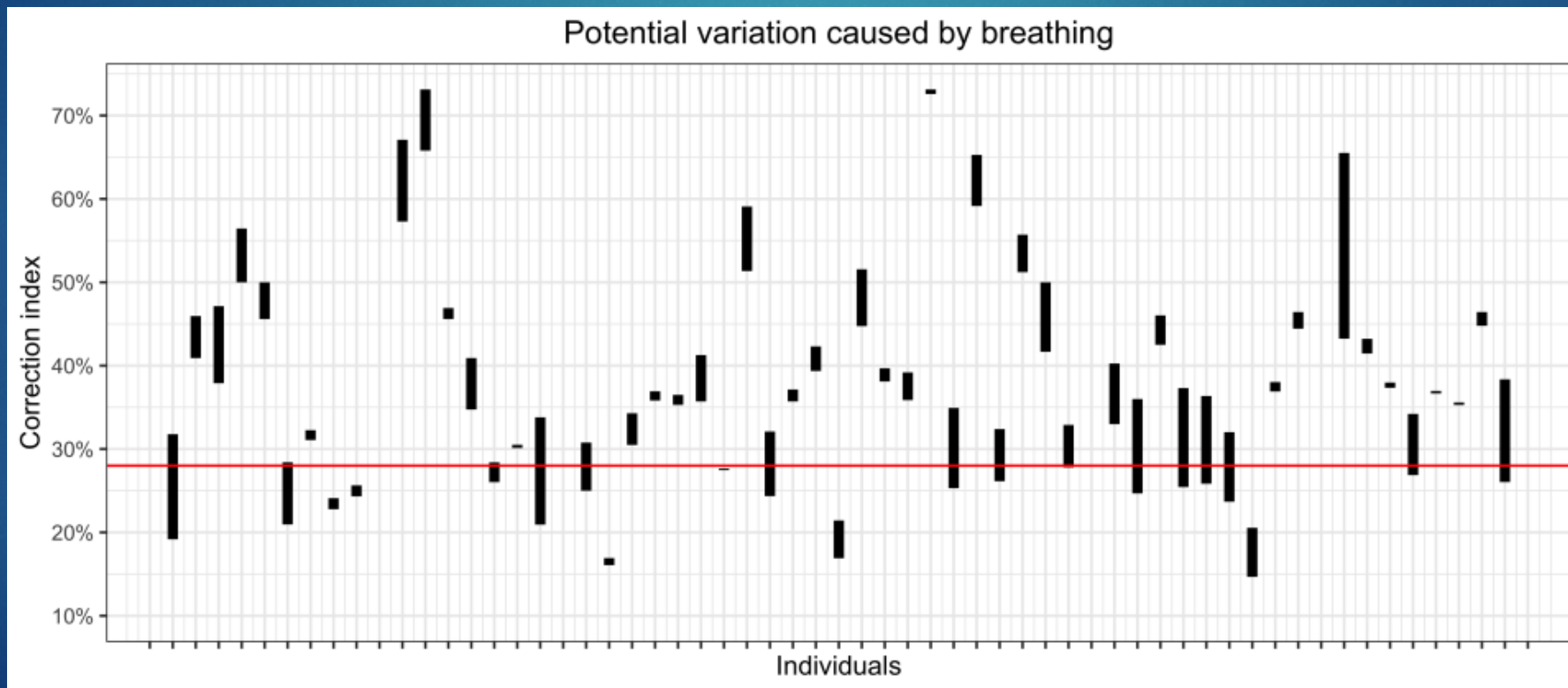
- ▶ 56 patients
- ▶ Median age 15.4 y (IQR 14.3–16.9 y)
- ▶ Lower variation in expiration



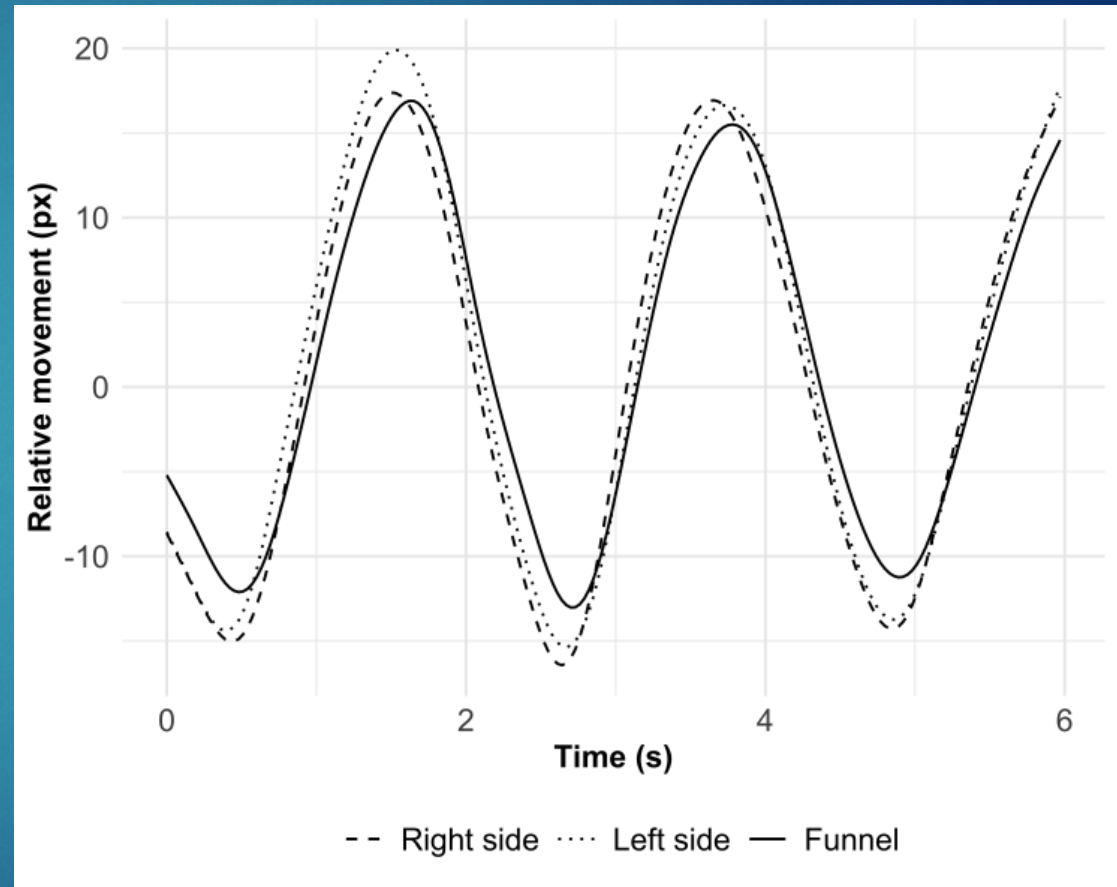
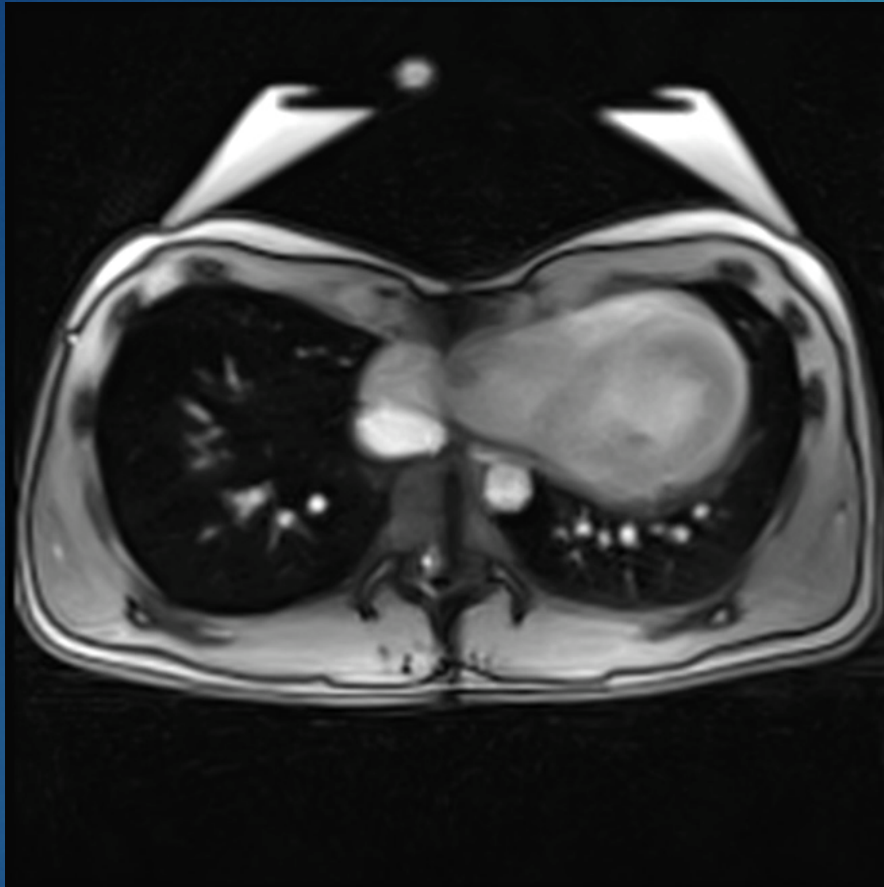
	Haller index	Correction index
Inspiratory variability	0.9 *	4,7% *
Expiratory variability	0.3	2.9%
	* significant	

# Results

- Crossing the „therapeutic line“ during breathing

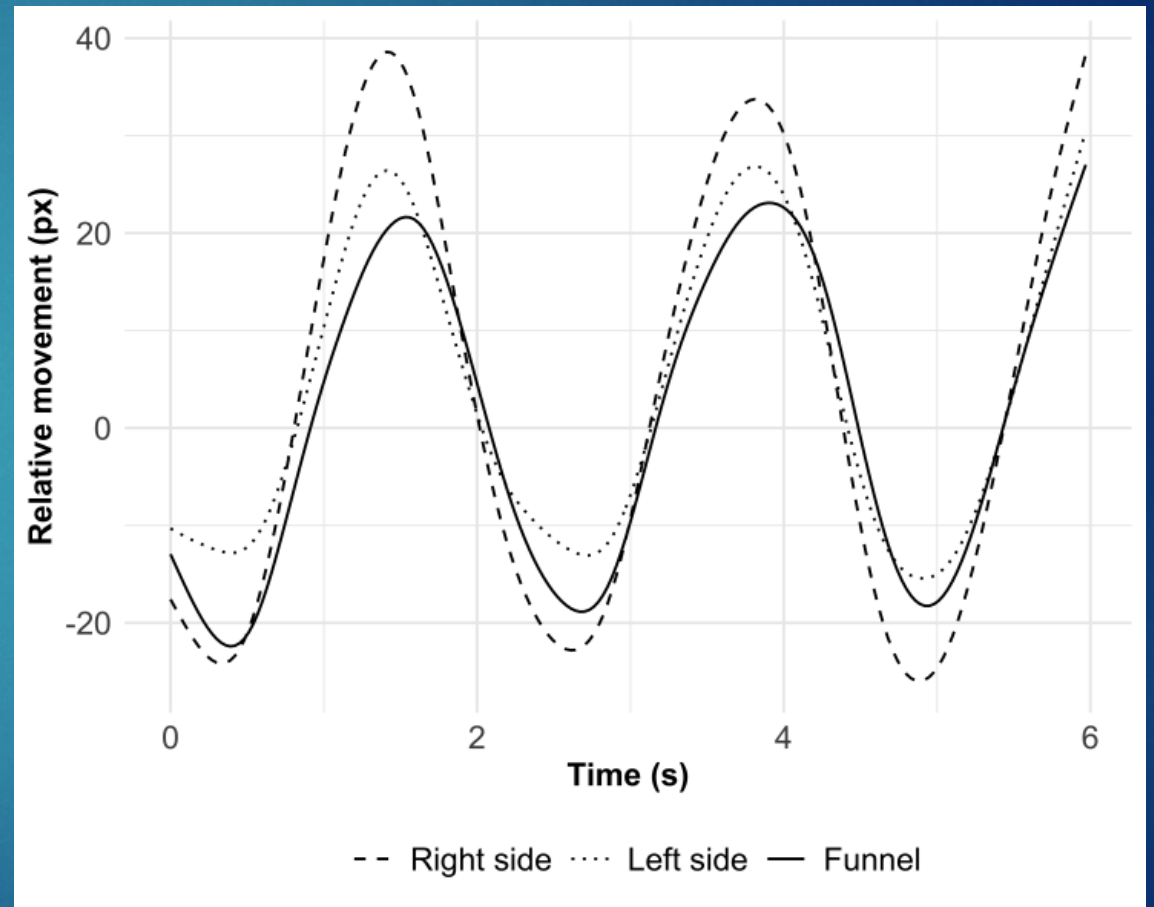


# Motion pattern „A“



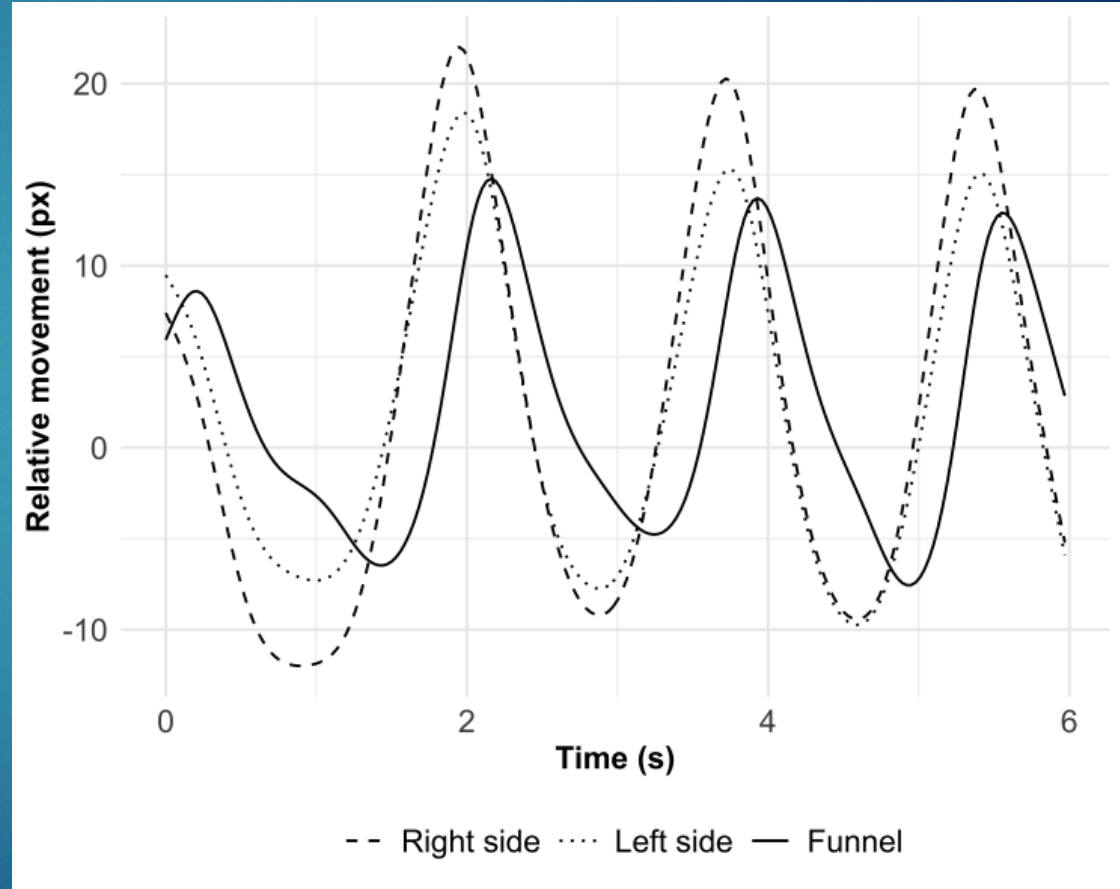
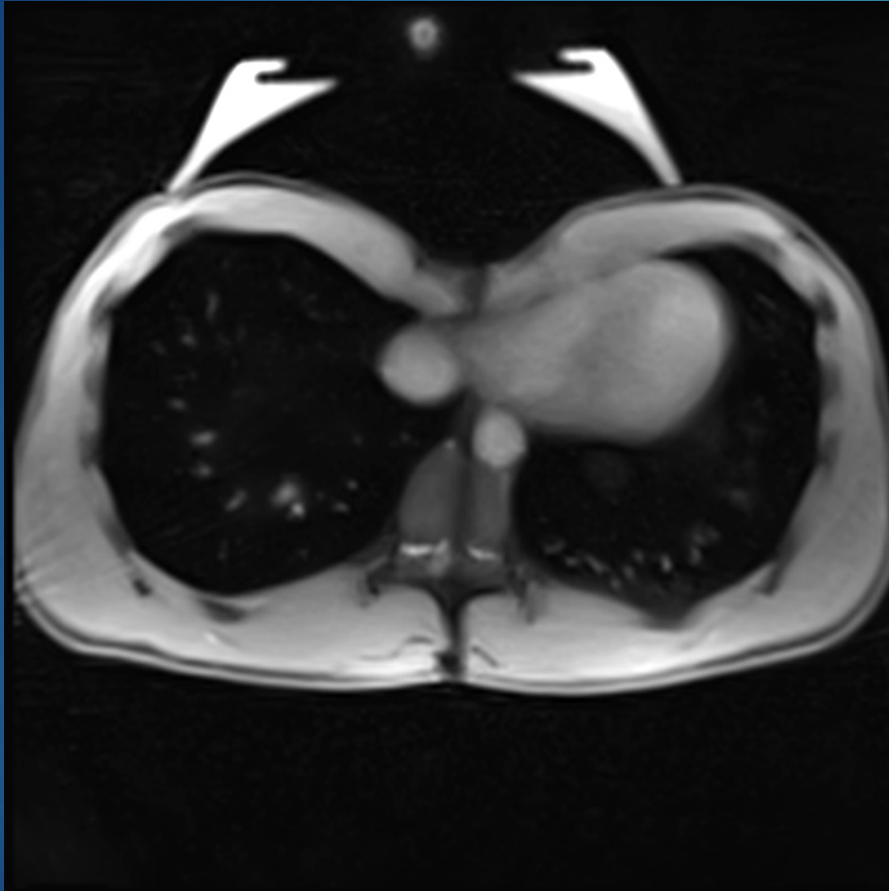


# Motion pattern „B“





# Motion pattern „C“



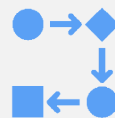
# Summary



Real-time MRI for Pectus excavatum is feasible



When breath-hold: Prefer mild expiration



3 different motion patterns -> prognostic factor?



Thank you

