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# Costal cartilage fractures

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DO WE HAVE TO REDEFINE TYPE B-FRACTURES OF THE CARTILAGE RIBS?

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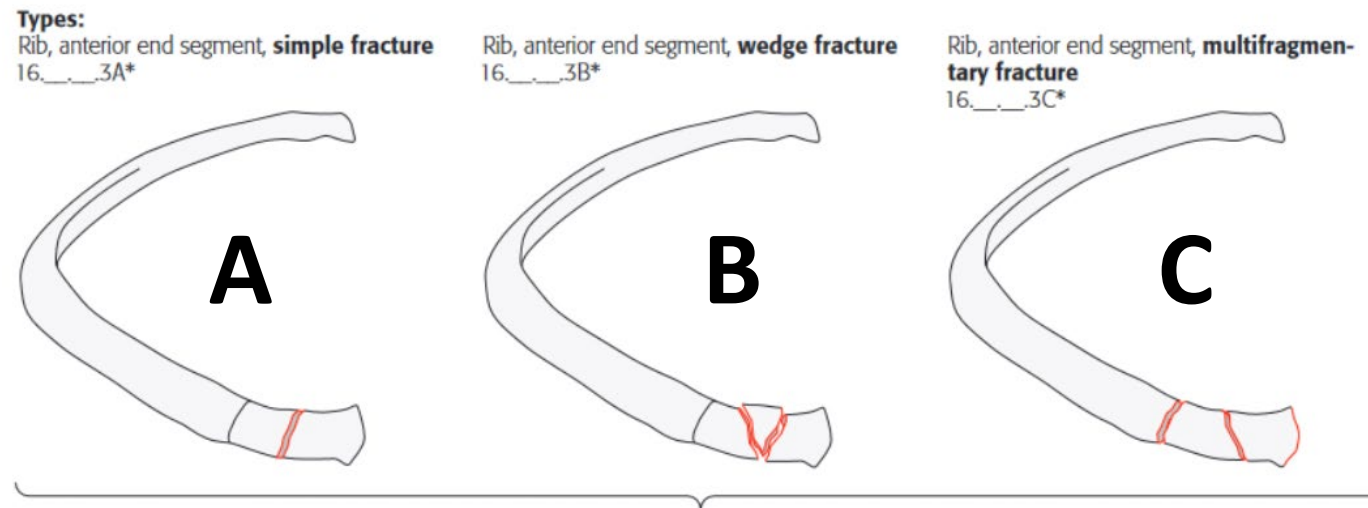




# Costal cartilage fractures

Do we have to redefine type B-fractures of the cartilage ribs?

Objective of this study is the morphologic validation of the AO-classification of the anterior costal cartilage.



\*Qualification for all rib fractures:

- f Flail segment—for each fracture that is part of a flail segment
- s fracture series—for each fracture that is part of a rib fractures series

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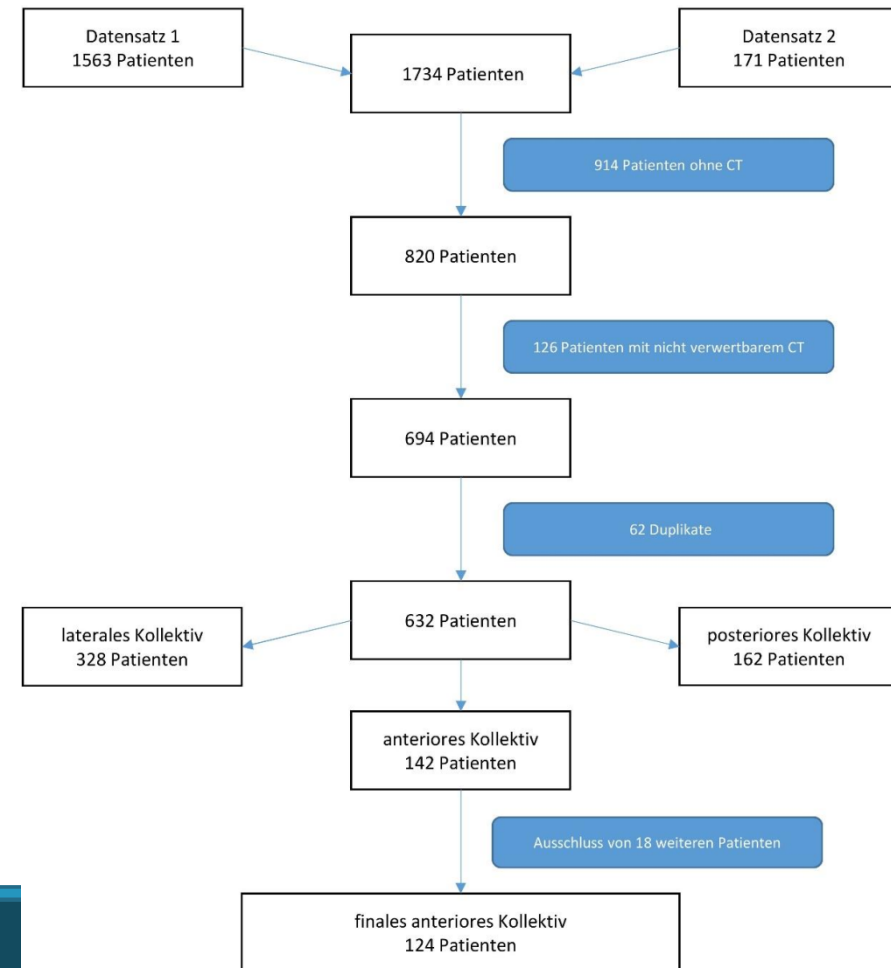




# Costal cartilage fractures

## methods

- all patients of a level I trauma center
- years 2011 to 2016
- fractures of the sternal bone and the anterior rib cartilage
- A total number of n=124 patients was included



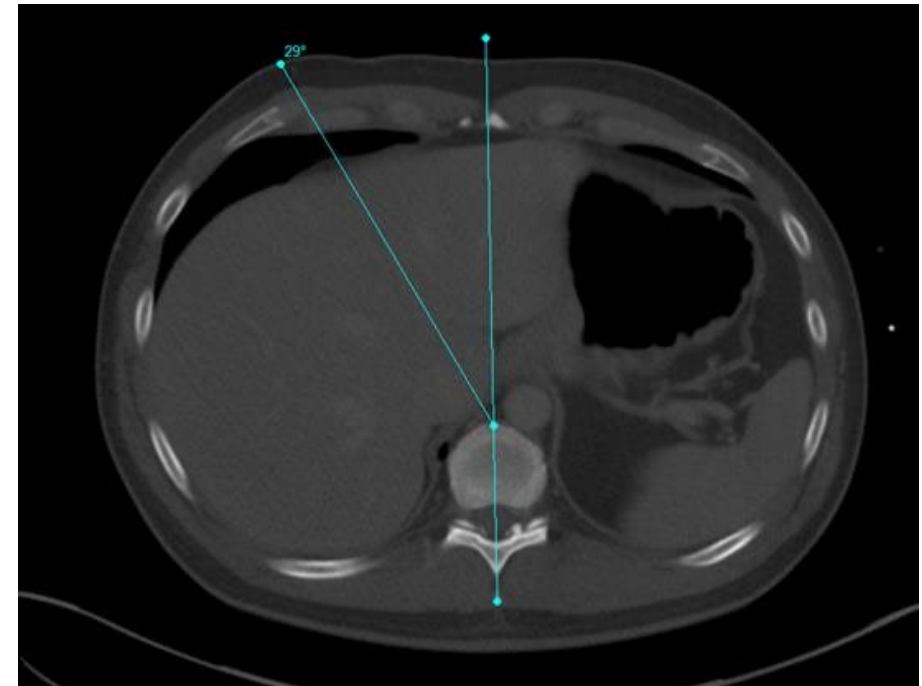


# Costal cartilage fractures

methods

CT evaluation:

- anatomical basic data of the rib cage
- every fracture with its position
- Dislocation
- fracture pattern (which was classified following the AO).



Costocartilage fracture right side, 29° position

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# Costal cartilage fractures

results

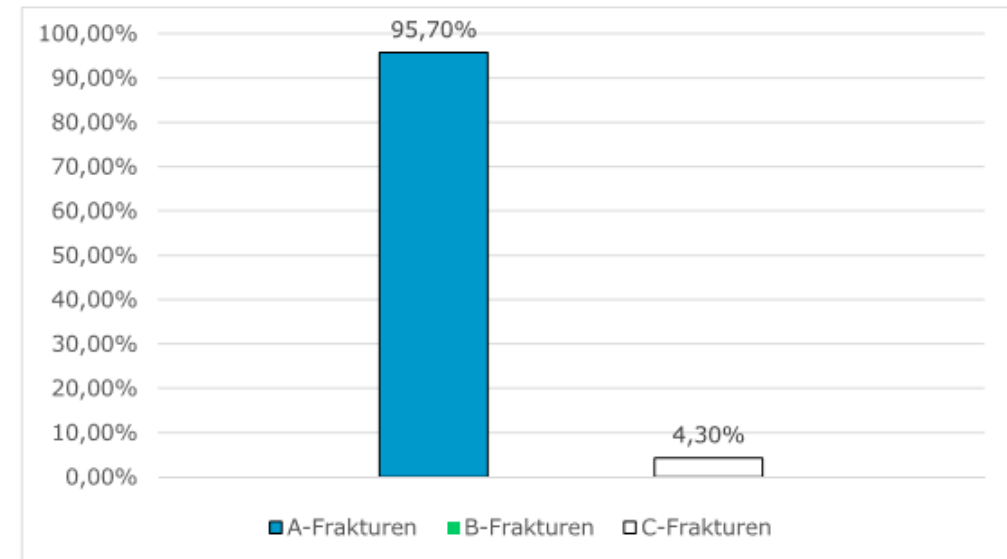
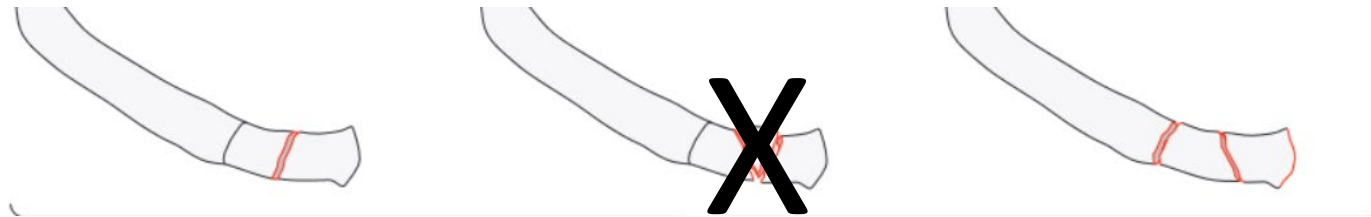
36 (29%) patients showed fractures of the rib cartilage

94 cartilage fractures were found within the collective

90 (95,7%) AO type A fractures,

0 (0%) Wedge fractures, AO type B

4 (4.3%) type C.



Distribution of the types of fractures –no B Type seen

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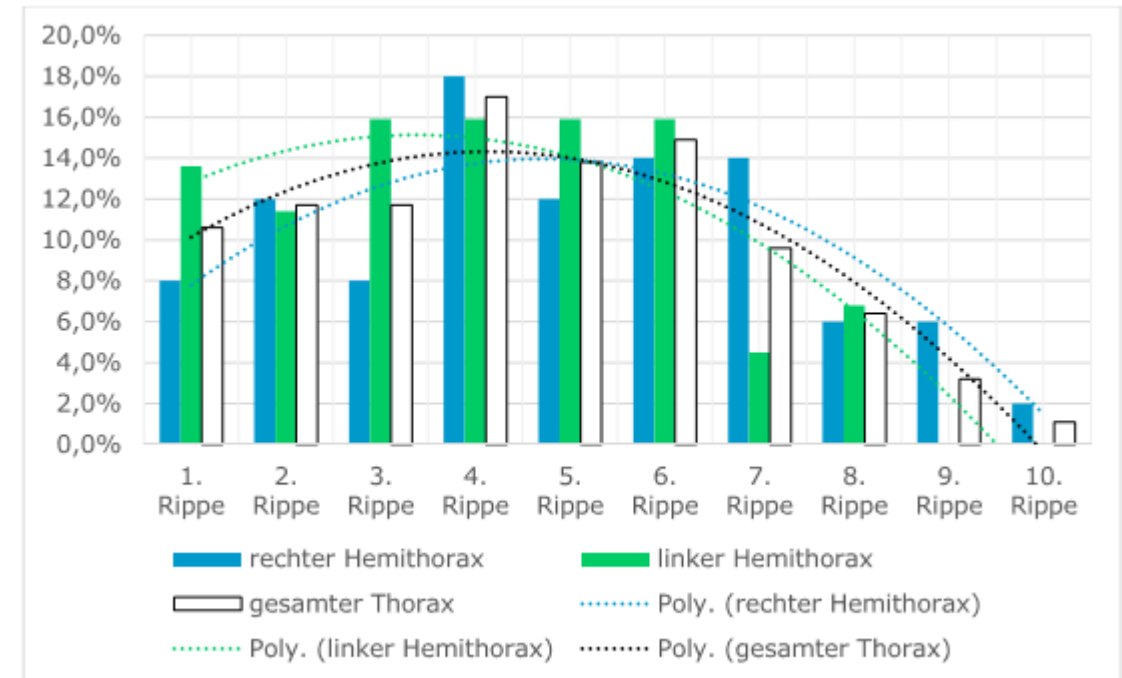




# Costal cartilage fractures

## results

Almost all fractures were located in the sternal related ribs, especially rib 3-7.



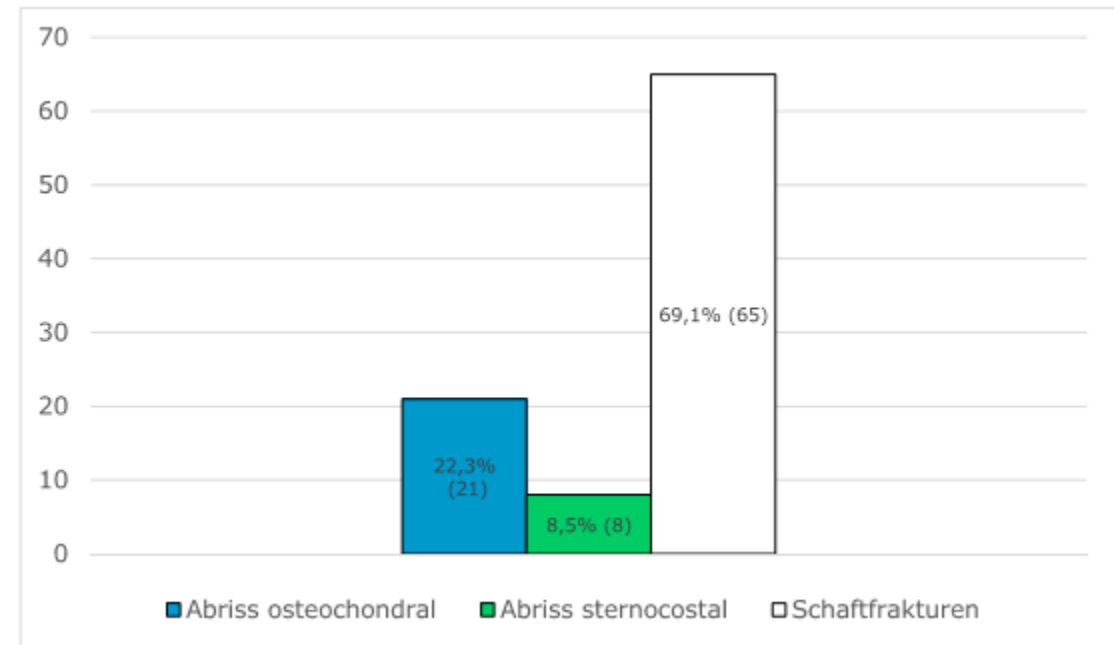


# Costal cartilage fractures

## results

30.9% (29) were avulsion fractures

- 22.3% (21) at the **osteocondral conjunction**
- 8,5% (8) of the **sternocostal joint**



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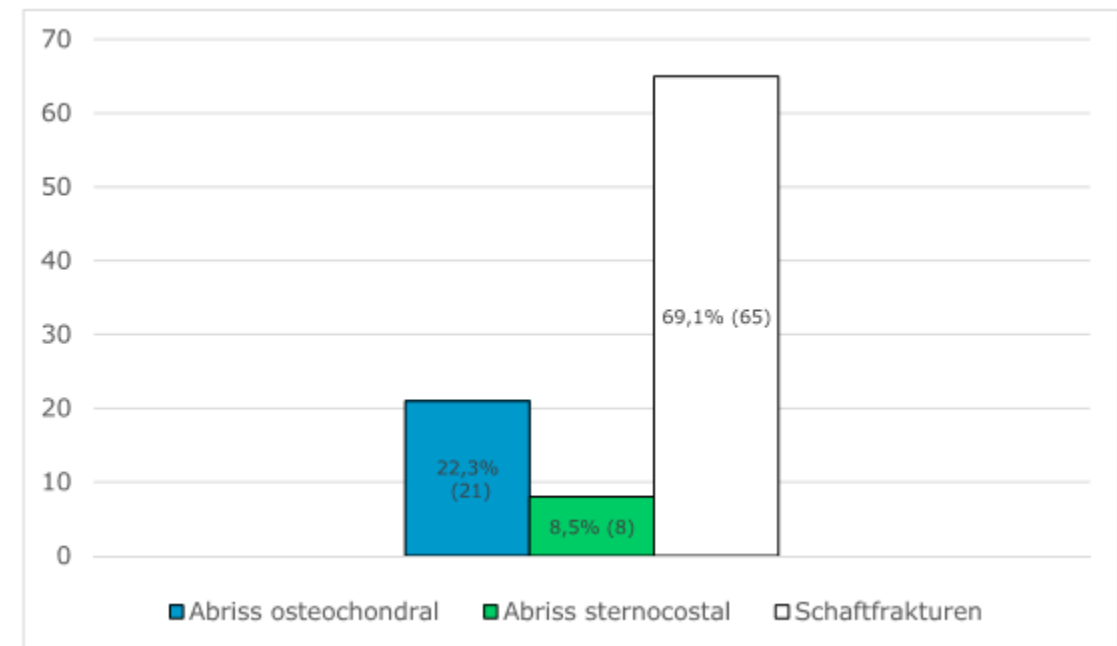
# Costal cartilage fractures

## results

30.9% (29) were avulsion fractures

- 22.3% (21) at the **osteocondral conjunction**
- 8,5% (8) of the **sternocostal joint**

91.5% (85) of the fractures were combined with a sternal fracture.







# Costal cartilage fractures

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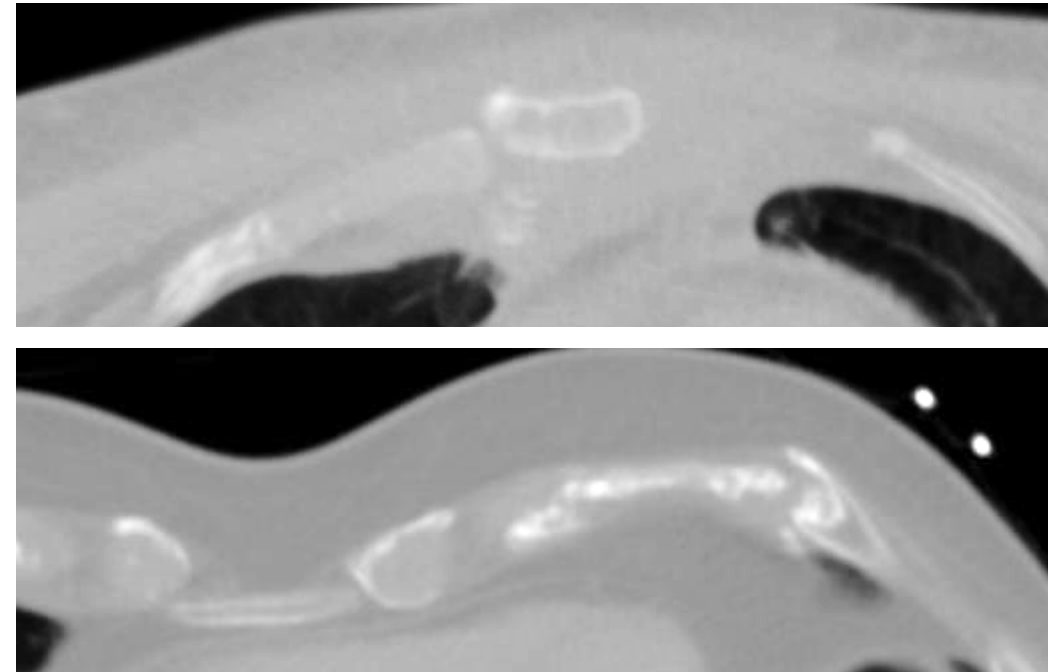
discussion

Cartilage fractures are associated to predisposed weak points in the skeletal structure

Those are the sternocostal

and

the osteochondral transition



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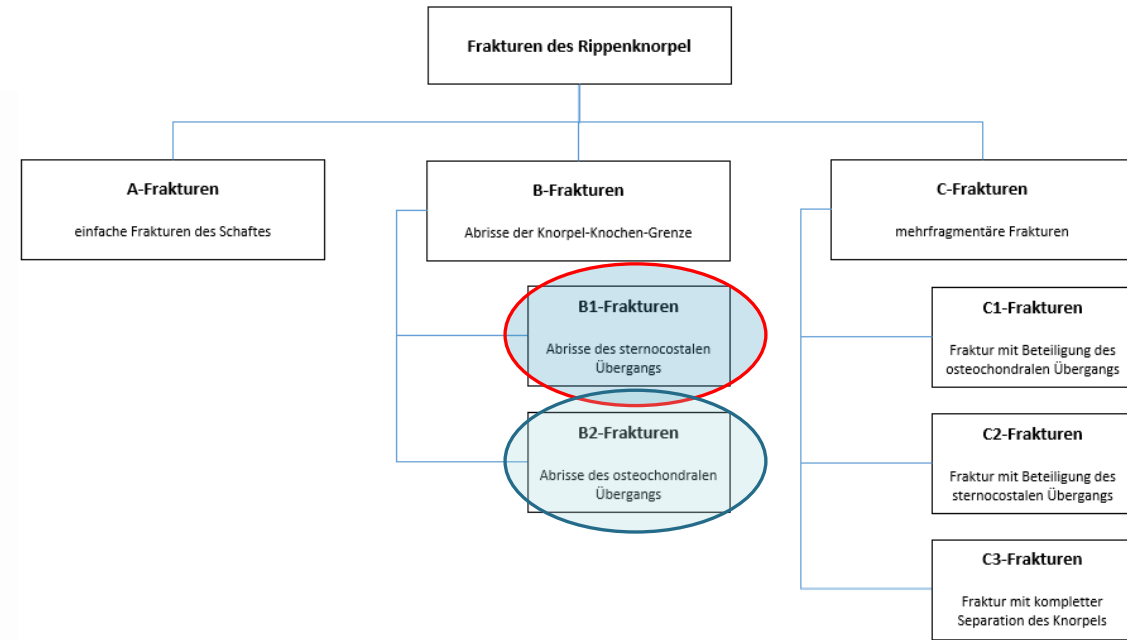
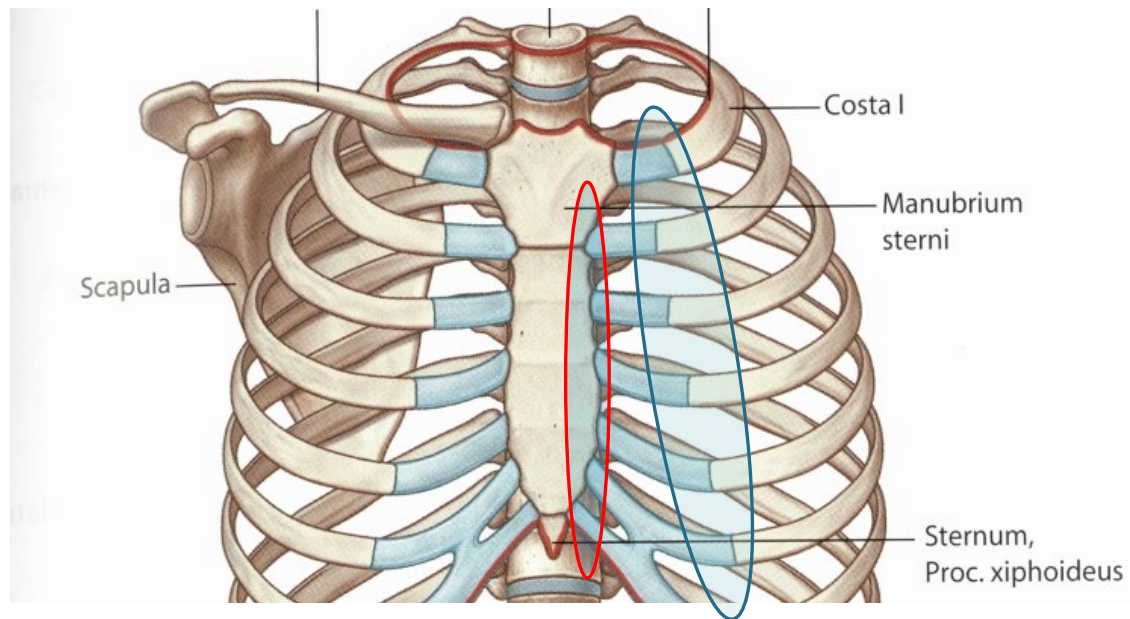
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# discussion

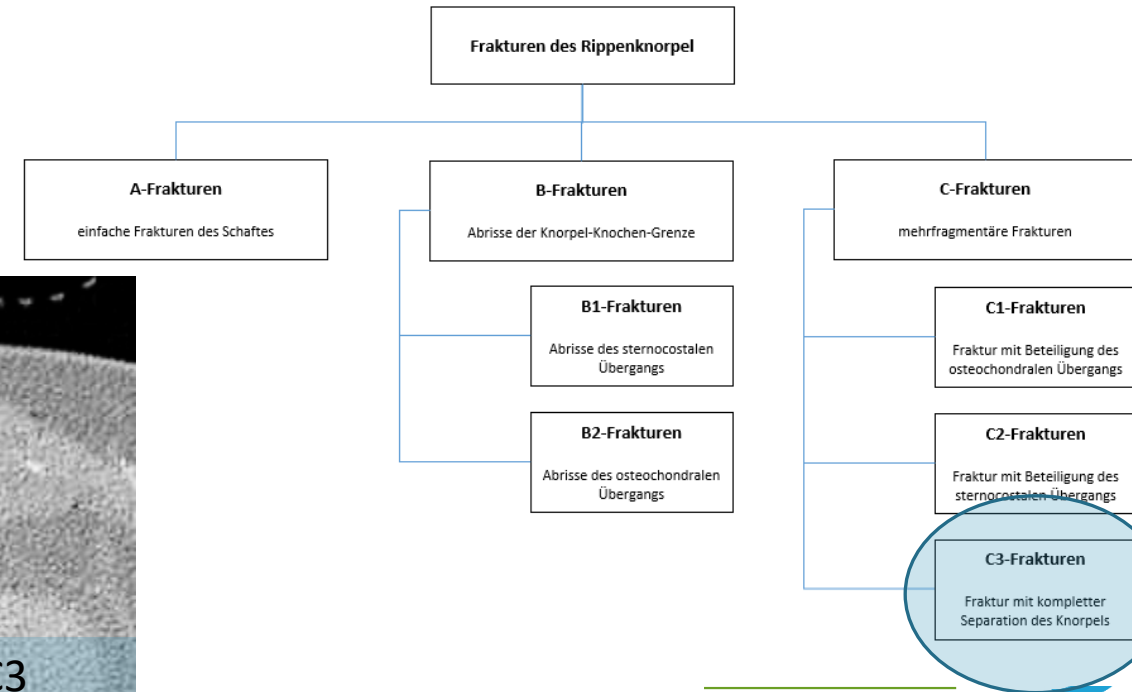
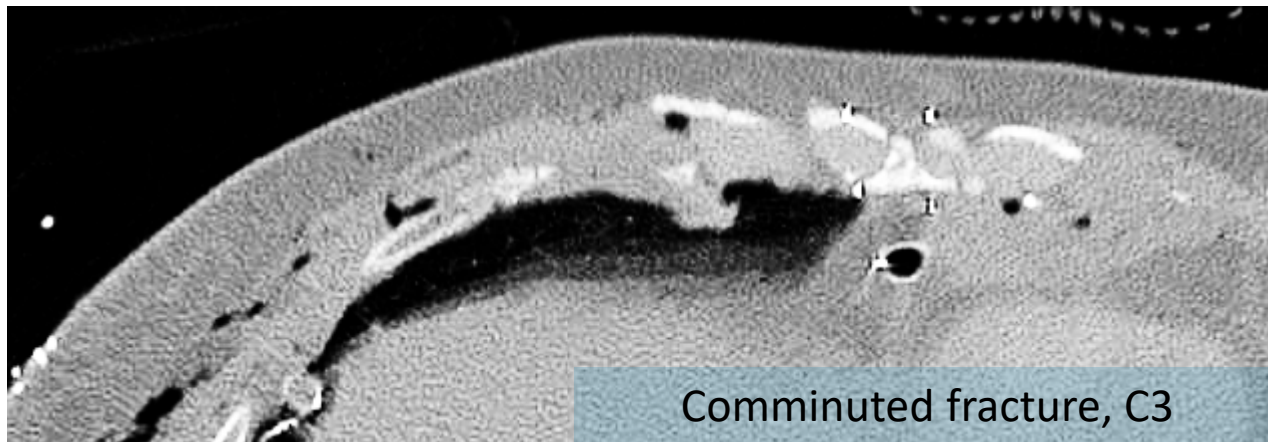
With no wedge fractures shown, maybe type B fractures should be reevaluated and be redefined as fracture of the cartilage joint.





# discussion

Type C fractures might then include each multifragmentary fracture, involving the cartilage shaft and one of the transitions (C1, C2) or a comminuted fracture (C3)



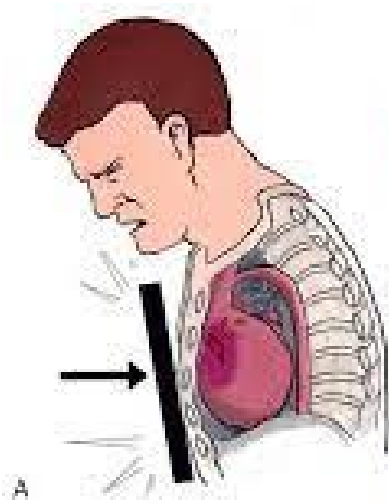


# discussion

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To break the cartilage an impact is needed, which frequently fractures the sternum too.

Cartilage rib fractures can be seen as concomitant injuries of a sternal fracture, but not obligatory.



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Thanks for your attention!  
Kind regards from Erlangen and Schwerin, Germany!

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