

Detection and correction of specular reflections in thoracoscopic images

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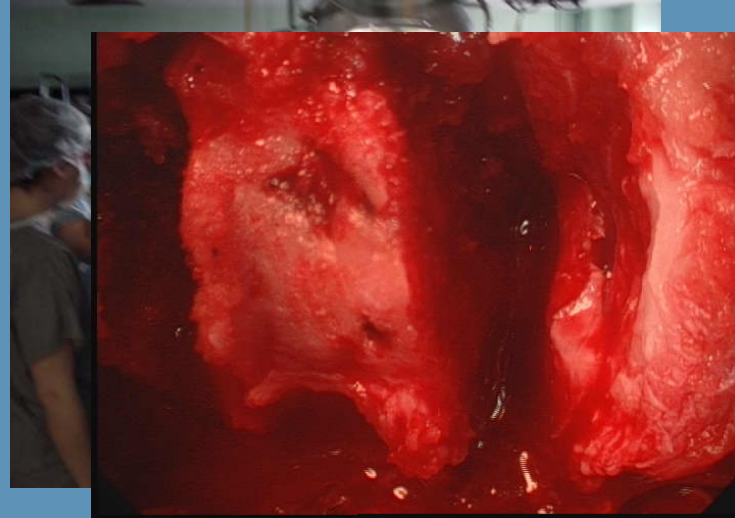
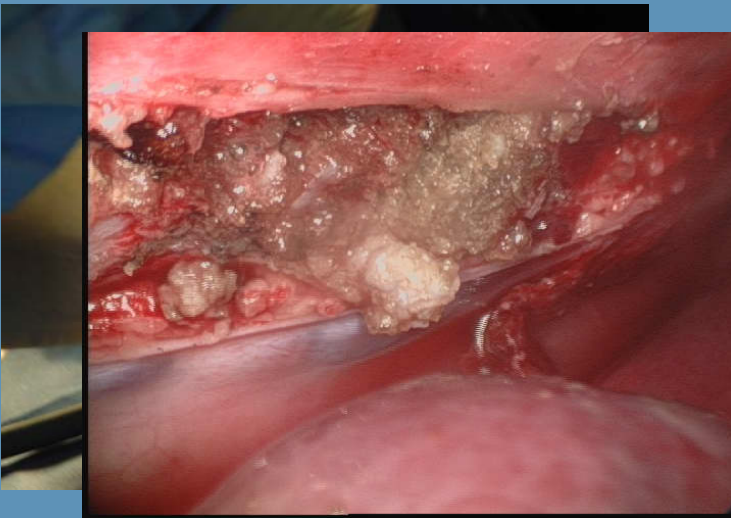
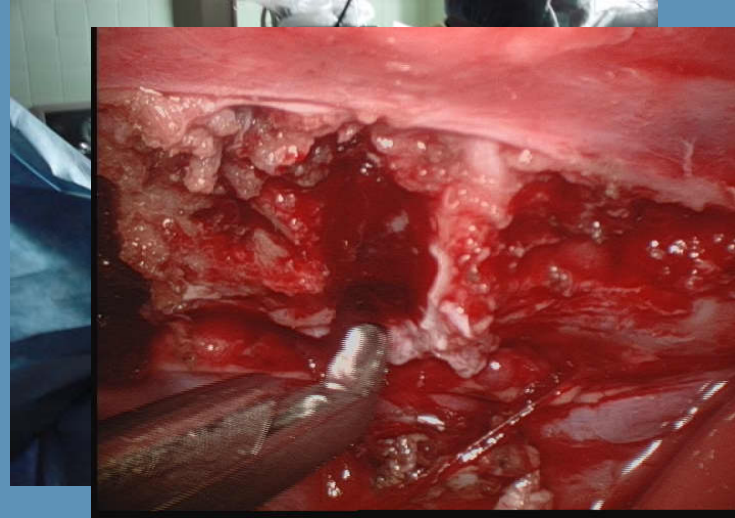
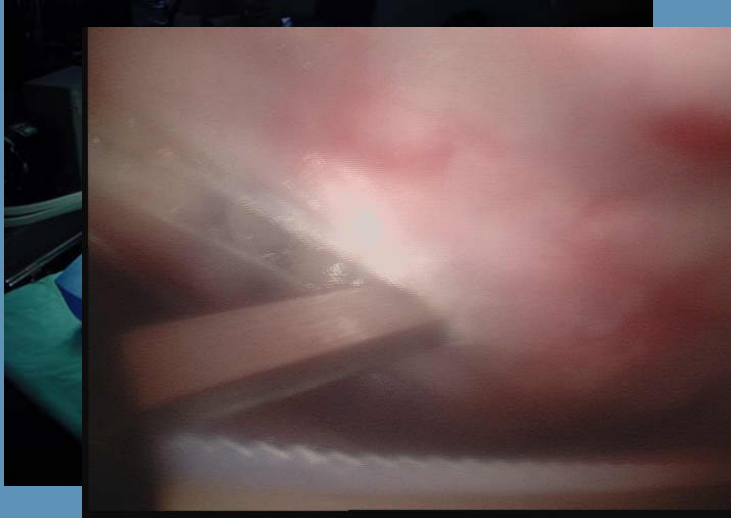
Co-supervisor : Guy Grimard, MD

2005-09-13

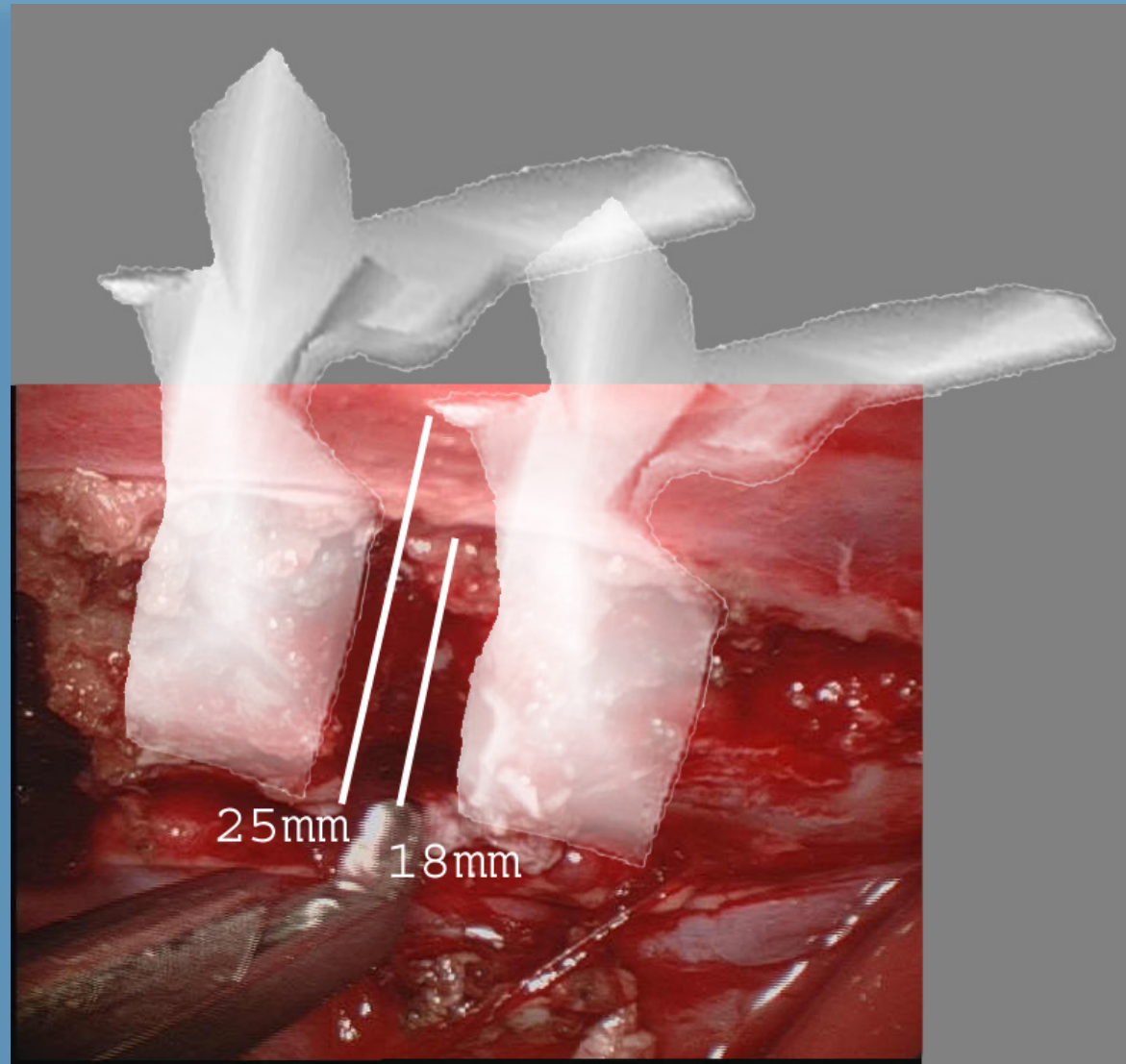
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Minimally-invasive surgery

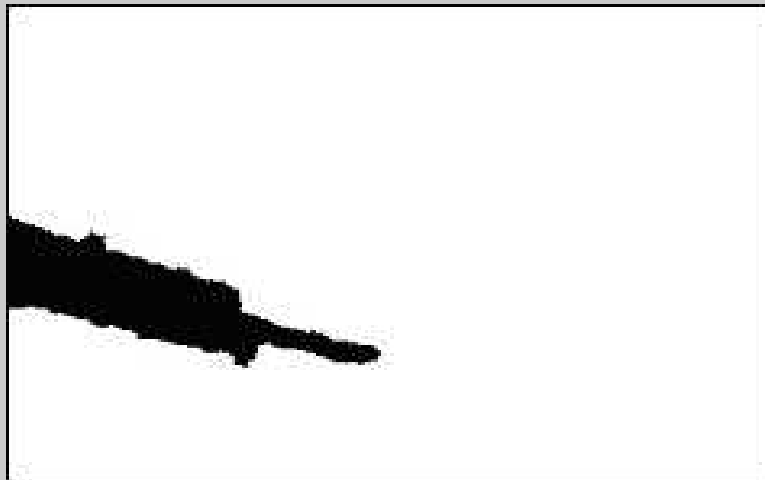


Augmented reality



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The problem



Automatic segmentation results of Boisvert

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Goals

- Main goal :
 - Automatic detection and correction of the specular reflections.
- Specific goals :
 - Enhance the specular reflections.
 - Denoise the intensity histograms.
 - Automatic detection of the specular bump.
 - Automatic extraction of the specular lobe.
 - Automatic filling of the hole in the specular mask.

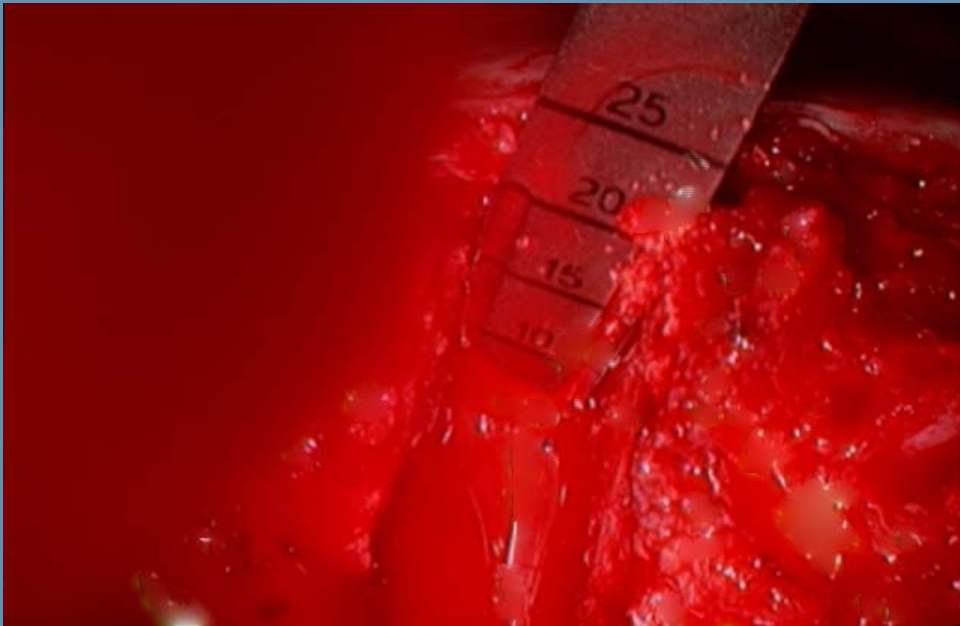
Results



Color image

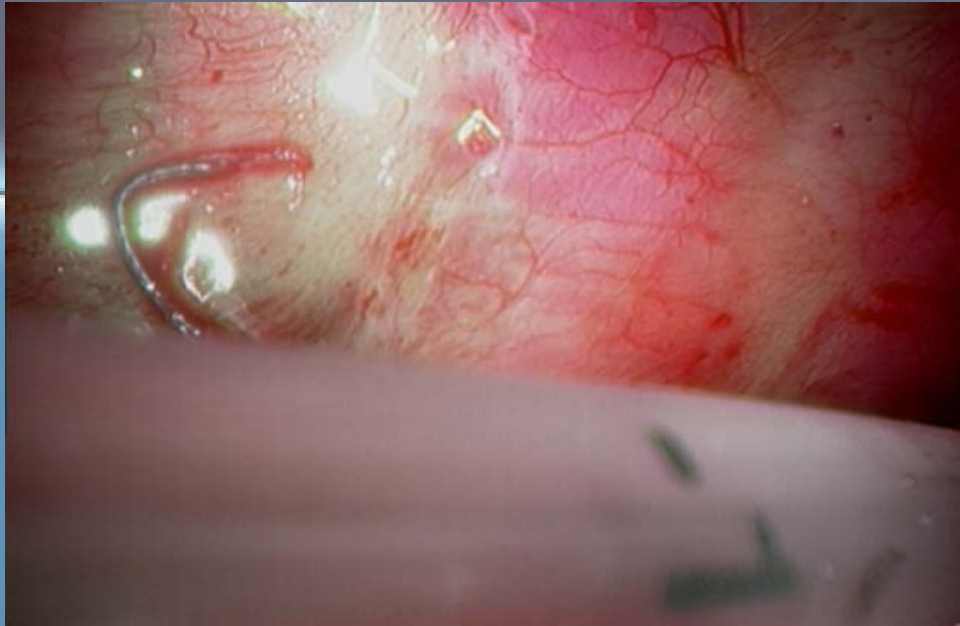


Detected reflections



Corrected image

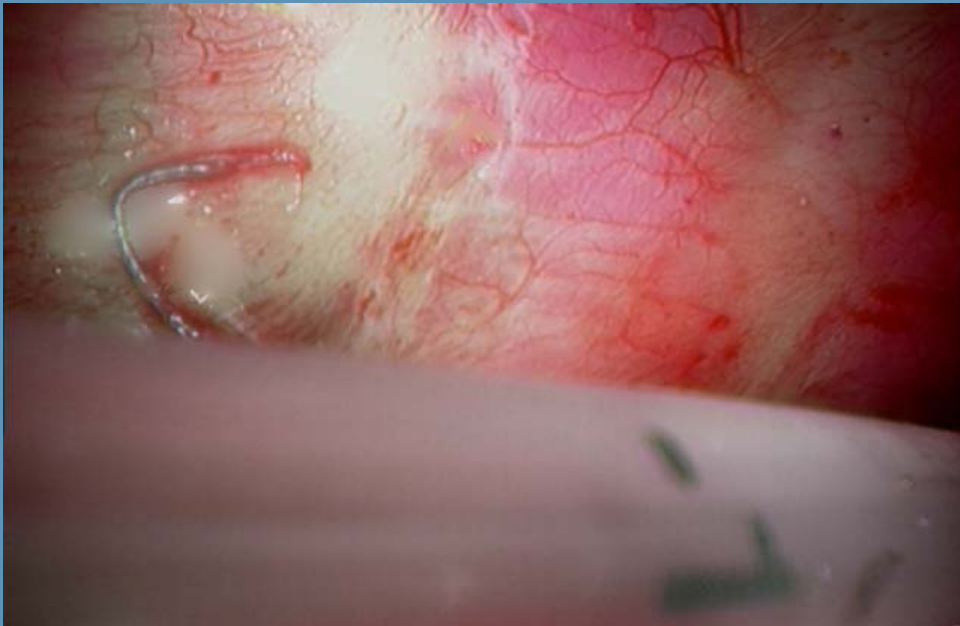
Results



Color image



Detected reflections



Corrected image

Discussion and conclusion

- Conclusive results for the specular spike detection.
 - Robust in presence of fat tissues.
 - Real-time detection of the specular reflections.
- New technique for the detection and the correction of specular reflection in thoracoscopic images has been validated on real images.
- New algorithm for the specular reflection enhancement.
 - New algorithm for specular reflection detection.
 - Elaboration of a dynamic threshold for the intensity descent.

Questions