SEMI-AUTOMATIC SEGMENTATION OF BOTH LUMENS IN AORTIC DISSECTION CT IMAGES

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Key Words: *Cardiovascular imaging, image segmentation, deformable models, competitive contours.*

ABSTRACT

Aortic dissection is a disruption of the medial layer of the wall of the aorta caused by intramural bleeding. As a result, a separation of the aortic wall layer in two lumens occurs. The disease is usually detected through computed tomography (CT) images, where accurate assessment of both lumens is crucial for treatment planning.

In this study, we evaluate the robustness and feasibility of our proposed competitive approach for the segmentation of both lumens [1]. Each lumen is represented by two cylindrical models in the B-spline Explicit Active Surface (BEAS) framework, which are manually initialized by providing 5 points along the path of each lumen. Then, a fast growing through competitive BEAS-threshold and a contour refinement using competitive BEAS-segmentation are applied. In order to preserve the integrity of each lumen, a competitive approach is applied between both surfaces. Therefore, each surface is locally constrained based on the position of the other one, preventing overlaps and allowing the refinement toward the real anatomy in regions with low contrast or even in the presence of leaks [1].

One abdominal CT from one patient with aortic dissection was used, where an accurate delineation of both lumens with a clear separation of both region was achieved. Hence, the competitive strategy proved to suitable for the segmentation of both lumens. Nevertheless, further studies with a larger database are required.

REFERENCES

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