RAPID AUTOMATED NEOPLASIA DETECTION IN CT COLONOGRAPHY USING A NOVEL TECHNIQUE

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CT Colonography (CTC), also known as Virtual Colonoscopy (VC) is an emerging colon-imaging technique. Conventional analysis of CTC datasets by radiologists is time-consuming. We present initial results of a study using novel analysis software to flag potential colorectal neoplasia. CTC datasets were obtained by abdominal CT scanning according to established protocols. The raw datasets were downloaded to a standard PC workstation and analysed using the novel software. The first phase of the analysis process involved extraction, or segmentation of a model of the colon lumen from the dataset and calculation the centreline for this model. The centreline was subsequently used for automating intraluminal navigation. The second phase of the analysis process involved locating anomalies projecting from the colonic mucosa and flagging them as potential lesions based on their size and morphology. The analysis results were viewed using several visualisation techniques, including 2D, standard 3D and virtual reality stereo. Validation of this technique using back-to-back CTC and conventional colonoscopy was performed. This technique has been tested using 5 CTC datasets. The average time required for analysis is 57 seconds (range 48 - 72). Automated analysis of CTC datasets can reduce review times by up to 50%. Although still in the early stages of development, the automated flagging algorithm can detect polyps > 5mm and can cater for several different morphologies. We have developed a technique for analysing CTC datasets that is rapid, accessible, and comparably inexpensive. Validation of this technique is currently taking place. This technique increases the potential uses of CTC in screening individuals at risk of colorectal neoplasia.