

The Evaluation of Diffusion Weighted MR Imaging for Perianal Fistulas

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PURPOSE

Initial studies of MR assessment of perianal fistulas have indicated the ability of MR imaging to demonstrate the course of fistulous tracks. However, to our knowledge the use of diffusion weighted MR imaging (DWI) has not been described in the literature.

In this study, we retrospectively evaluated the value of DWI to make recommendations for the use of MR imaging in assessing perianal fistulas.

MATERIAL AND METHOD

PATIENTS: This retrospective study was included 16 MR examinations with 14 consecutive patients (9 men and five women, ranged in age from 26 to 73 years old). Eight patients had undergone perianal surgery for abscesses or fistulas, so this group was active inflammation group (AIG). On the other hand, four patients had undergone clinical follow-up and another four patients had undergone drug treatment, so this group was non-active inflammation group (non-AIG).

MRI TECHNIQUES: Patients underwent MRI on a 1.5-T MRI system (Signa CV/i ver. 9.1 GE Medical System Milwaukee, WI) using a pelvic phased-array coil. Spin-echo T1-weighted image (T1-WI : TR/TE, 600/14) and fat-suppressed spin-echo T2-weighted image (FS-T2-WI : 4,000/90; echo-train length, 13) were performed in the axial plain for all patients using a multi-section technique. The slice thickness was 5 mm with a 0.5-mm interslice gap, matrix size was 256 × 224, and the field of view was 220 × 220 mm. The DWI were acquired using a single-shot EPI sequence. The slice thickness was 5 mm with 0.5-mm gap, matrix size was 128 x 192, and the field of view was 420 x 210 mm. The BW was 110 kHz, TR / TE was 5200 / 83.7 msec, flip angle was 90 degree, averages were 8, b-value was 0 and 1000 sec/mm². The apparent diffusion coefficients (ADC) values were calculated from two DWI acquired with b 0 and 1000 sec/mm². The ADC maps were reconstructed by calculating the ADC values in each pixel of each slice.

EVALUATION: The two groups (AIG and non-AIG) were retrospectively compared for appearance of FS-T2-WI to that of DWI in assessing perianal fistulas.

RESULT

FS-T2-WI was able to indicate the presence site of all lesions. DWI was useful to detect the small lesions (size 5mm). DWI was not useful to evaluate an anatomic diagram, because DWI could not clear showed anatomy. However DWI was good sequence for understanding to spread of inflammation.

The abscess and fluid collection were clear shown high signal intensity by FS-T2-WI. And the DWI indicated active inflammation as abnormal signal intensity. More, the ADC value was useful for suspected of the degree in the inflammation. The ADC value of AIG was 0.915 ± 0.077 ($\times 10^{-3} \text{mm}^2/\text{s}$). And the ADC value of non-AIG was 1.333 ± 0.243 ($\times 10^{-3} \text{mm}^2/\text{s}$). There was significant difference between AIG and non-AIG by the Mann-Whitney U-test. ($P < 0.05$)

CONCLUSION

The FS-T2-WI was useful to detection of the location and spread of perianal fistula and abscess. Especially, the DWI was useful to suggestive to the degree of inflammation.

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