

The “Clover Sign” of Internal Fistulas in Crohn Disease

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Mini Review

The “Clover Sign” is radiological finding used to metaphorically describe imaging appearance of a complex fistula in Crohn disease. It refers to the presence of blossom-like arrangement of dilated bowel loops with internal fistula, resembling the clover leaves (Figure 1) [1,2]. CD is chronic, relapsing inflammatory disorder that may be seen in any segment of gastrointestinal tract but most frequently affects small and large intestine. Terminal ileum is involved in the majority of cases. CD can be divided in two types: perforating and non-perforating. Due to deep transmural inflammation and consequently formed ulcerations, main complications seen in perforating forms are fistulas, abscess formations, and free perforation [1]. Fistulas occur in up to 35% of patients with CD and can be further categorized as external and internal. External fistulas are defined as tracts that connect intestinal lumen and cutaneous surface. Most commonly seen localization of this type is in perianal region. Depending of origin and endpoint, internal fistulas can present as enteroenteric, enterovaginal and enterovesical. Enteroenteric fistulas include gastrocolic, duodenocolic, ileoileal, ileocolic and colocolic fistulas [3]. Solitary and complex fistulas are different morphologic subcategories of internal fistulas. Both can be evaluated by MRI (enterography and enteroclysis) as well as their initial stages, presented by intestinal wall irregularities due to spiculated infiltrations into the surrounding mesenteric fat and also by blind-ending tubular structures, called sinus tracts.

Solitary fistula is hollow tract that arises from affected bowel segment and typically perforates into adjacent bowel or abscess cavity [1,4]. Complex fistula appears as a stellate configuration of two or more affected bowel loops interconnected with branched fistula

converging toward centrally fixed point. This star-like or blossom-like arrangement of converging fistulous tracts and bowel loops to one central point resembling clover leaves is highly indicative for complex fistula [5] (Figure 1), and metaphoric photo, (Figure 2). MR (particularly enterography) is useful and accurate imaging technique for evaluation of luminal, transmural and extraluminal manifestations of CD as it provides high efficiency in assessment of the degree of disease activity and detection of possible complications [4]. Further treatment usually depends of these findings.

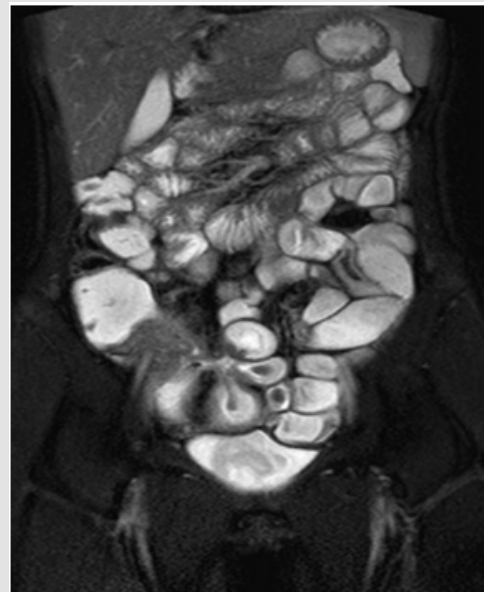


Figure 1



Figure 2

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