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Review *Derleme*

THE INFLAMMATION OF EPIPLOIC APPENDIX: PRIMARY EPIPLOIC APPENDAGITIS

Epiploik Apendiks Enflamasyonu: Primer Epiploik Apandajit

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ABSTRACT

Epiploic appendices are extensions of omentum which covers most of the colon. Most of the pathologic changes are related with spontaneous torsion or venous thrombosis culminating with inflammation and is referred as primary epiploic appendagitis (PEA). There is no pathognomonic symptom, finding or laboratory test for this relatively rare intra-abdominal inflammation. A non-toxic patient with acute onset localized abdominal pain in the right or left lower quadrant is the typical presentation. Imaging studies such as ultrasound and tomography with the awareness of PEA in differential diagnoses of intra-abdominal pathologies are the key to correct diagnosis. Since the conservative treatment is sufficient in most of cases, accurate and timely diagnosis can ensure the appropriate patient management and can prevent unnecessary hospitalizations and interventions.

Keywords: *Appendix epiploica, appendagitis, fat necrosis, acute abdomen, differential diagnosis*

ÖZ

Epiploik apendiks kolonun çoğunu kaplayan omental uzantılardır. Patolojik değişikliklerin çoğu spontan torsiyon veya venöz tromboz sonrası oluşan enflamasyon ile ilişkilidir ve primer epiploik apandajit olarak adlandırılır. Nispeten nadir görülen bu intra-abdominal patoloji için herhangi bir patognomonik semptom, bulgu veya laboratuvar testi yoktur. Sağ veya sol alt kadranda akut başlangıçlı lokalize karın ağrısı olan non-toksik görünümdeki hasta tipik prezentasyondur. İntra-abdominal patolojilerin ayırıcı tanısında primer epiploik apandajit farkındalığı ile ultrason ve tomografi gibi görüntüleme çalışmaları doğru tanı koymada anahtar role sahiptir. Konservatif tedavi çoğu durumda yeterli olduğundan doğru ve zamanında tanı ile uygun hasta yönetimi sağlanıp gereksiz hastane yatışları ve girişimler önlenebilir.

Anahtar Kelimeler*: Apendiks epiploica, apandajit, yağ nekrozu, akut batın, ayırıcı tanı*

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INTRODUCTION

There are many alternatives in nomenclature for epiploic appendix (EA) like epiploic appendices, appendices epiploicae, epiploic appendages, appendix epiploica, or omental appendices. The medical definition of "epiploic" is omental or associated with the omentum, and "appendage" relates to extensions or a smaller part that is attached to something larger or more important. EA can be described as omental fatty extensions that distribute on the external surface of colon from the cecum to the rectosigmoid junction.

The embryology and anatomy of EA have been described firstly by Vesalius in 1543 (1). The cumulative knowledge from that time reveals much more detailed anatomical features. For example, an average adult body contains high number of these structures as many as 50-100 (2). They are generally 1-2 cm thick and 0.5-5 cm long, but they can be extremely long up to 15 cm (3). They originate from anterior and the posterior taenia coli and are localized throughout the external surface of the whole colon while the majority are found around the sigmoid colon and the caecum. They have a limited circulation system that consists of 1 or 2 arterioles and a small draining vein within a stalk, with or without lymphatic drainage. The pedunculated shape, excessive mobility and limited blood supply make EA prone to ischemia and/or torsion. The function of EA is not certain but the bacteriostatic potential, being a part of colonic absorption and mechanical protection of the colon are the most advocated theories (4,5).

EA pathologies are a rare cause of acute abdominal pain. EAs are mainly affected by spontaneous torsion, primary or secondary inflammation, thrombosis, calcification and strangulation in hernias. The most common pathology is a self-limiting condition called epiploic appendagitis, which can be primary or secondary. While secondary epiploic appendagitis develops following the inflammatory processes in adjacent structures, such as in cases of any intra-abdominal inflammation like appendicitis, diverticulitis or cholecystitis, the main focus of our review will cover primary epiploic appendagitis (PEA) (6,7).

PEA results from spontaneous torsion of the EA or thrombosis of the venule of the EA followed by ischemic or haemorrhagic infarction and inflammation. The histopathologic investigations generally reveal necrosis in adipose tissue, haemorrhage and lymphoplasmatocytic infiltrate without involvement of bowel wall. The PEA may also detach from the omentum and become a loose intraperitoneal body as Virchow suggested in 1853.

Clinical Manifestations

The typical age range for PEA is found as 12-76 years with a peak of incidence at the age of 40 years with male gender dominancy (2,8-10). The literature incidence ranges between 1,65-7,1% in cases of acute abdominal pain (8,11-13). The reported colonic involvement sites for PEA are mainly indicating the sigmoid colon and the cecum respectively as EAs are larger in size and more abundant on the left side of the colon compared to the right side (2,7,8,11). PEA is an extremely rarer entity in the paediatric age group (14).

Some risk factors like obesity, sudden weight loss and strenuous exercise are defined, however without a clear mechanism. This is still a subject to debate (2,9,13,15).

The time between the onset of the symptoms and the admission to the hospital can be 4 hours-7 days (2,8,13). The general appearance of the patients with PEA is not indicative of any toxins. A localized abdominal pain lasting less than one week is the mostly observed symptom in patients as opposed to anorexia, nausea fever or vomiting. Pain is localized, steady, non-migratory, non-radiating with an intensity of 4-8 in the visual analogue scale (VAS) and the rating may be increased by coughing, deep breathing or stretching due to the proximity with adherent parietal peritoneum. The physical examination generally reveals a localized abdominal tenderness which can be right-sided or left-sided, sometimes associated rebound (≤25%) or

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abdominal mass, but abdominal rigidity is not expected (8-10,16-17). Fever, especially higher than 38.0°C is rarely seen contrary to expectations (2,8-10).

The blood tests are not very useful as leukocytosis (12.9%) and bandemia are relatively rare and the other inflammatory markers are normal compared to other common intra-abdominal pathologies (2,8,9).

The differential diagnosis of PEA should include acute appendicitis, diverticulitis, cholecystitis, haemorrhagic ovarian cyst, ovarian torsion, ectopic pregnancy, colorectal cancer and mesenteric lymphadenitis. It is not surprising that PEA is mostly misdiagnosed as diverticulitis and acute appendicitis due to their higher incidence and the shared location of pain. In a study with 660 cases suspected of having appendicitis or diverticulitis, only 2% of them were found positive for PEA (11). Considering that PEA is not generally preferential for the presumptive diagnosis of acute abdomen, it should be included in differential diagnoses of these more common conditions.

DIAGNOSIS

Since the clinical presentation is nonspecific and the lack of pathognomonic laboratory tests for PEA, it is rarely diagnosed prior to imaging. With the increased awareness of PEA and its imaging features, the numbers of incidental diagnoses during laparotomy are now declining.

The imaging options for PEA are ultrasound (US), computed tomography (CT) and magnetic resonance imaging (MRI). A healthy EA is not visible on US or CT, except in the presence of an intraperitoneal fluid such as ascites or haemoperitoneum. When the EA is inflamed, it can be detected by its pathognomonic properties on different imaging techniques.

The characteristic US features are an oval non-compressible hyperechoic mass adjacent to the colonic wall under the location of maximum tenderness while Colour Doppler US reveals no central blood flow within this mass (17-20). US has certain advantages such as its relative low cost, lack of ionizing radiation and its portable nature, but it is highly operator-dependent. As the interpretation of US is challenging and the findings are not very stable, physicians generally prefer CT as the first imaging choice or as the second choice after US to confirm the diagnosis.

PEA on CT appears as an oval fatty mass less than 5 cm in diameter which has slightly higher attenuation than the peritoneal fat adjacent to the colon, mostly with perilesional inflammatory changes. The CT appearance of PEA has some characteristic radiological findings like “the hyper-attenuating ring sign” and “central dot sign”. The “central dot sign” also known as the ‘‘dense central vessel sign’’ is attributed to engorged or thrombosed vascular pedicle within the inflamed epiploic appendage. Although it is highly pathognomonic for PEA, it cannot be observed in all patients (21,22). Conversely, the hyperattenuating ring sign is a more frequent imaging feature. It forms due to serosal oedema that encloses a well-defined rounded or ovoid focus of paracolic fat (21-24). A lobulated appearance is possible and calcification within the infarcted lesion may be seen in time. The CT findings are expected to resolve in 6 months after the acute presentation (13,21).

MRI findings are very similar with CT and include an oval-shaped fat intensity mass with a central dot on T1 and T2-weighted images which show an enhancing rim on postgadolinium T1-weighted fat saturated images (20).

MANAGEMENT

PEA had been mainly treated with surgery in the past because of the lack of advanced imaging modalities, non-specific clinical presentation of the patients and the misdiagnoses as acute appendicitis, diverticulitis, cholecystitis or other acute abdominal condition. Naturally, the non-specific presentation of PEA has not changed, but alternative and more advanced imaging techniques provide a more accurate diagnosis of intra-

abdominal pathologies. Nowadays, unnecessary surgery is mostly related with the unfamiliarity of physicians to the diagnosis of PEA. Fortunately, the presumptive and accurate diagnosis of PEA is increasing day by day over the last two decades (8).

Conservative treatment with analgesia is usually sufficient in most patients due to the self-limiting nature of the condition which lasts 4-10 days. Antibiotics are not routinely required except in rare cases which colonic bacteria infiltrate and cause localized abscess formation or generalized peritonitis. Surgical treatment is necessary if PEA results in adhesions due to inflammation in adjacent tissues, subsequent ileus, intussusceptions, peritonitis, or abscess formation (25). The recurrence rate after conservative therapy which is reported up to 40% in a study is still a controversial topic (2). Some authors support surgery in recurrent cases.

Isolated PEA has a benign prognosis and mortality due to PEA is quite rare but can be seen in patients with extreme co-morbid conditions and seconder epiploic appendagitis (26).

CONCLUSION

EAs are small adipose structures that are extentions of omentum on the colonic surface. They can cause significant abdominal pain if they are inflamed. The clinical prognosis of PEA is generally benign and self-limiting. EA should be especially considered in differential diagnoses of sigmoid diverticulitis and appendicitis. An accurate and timely diagnosis can be achieved by awareness of this diagnosis and familiarity with imaging features.

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