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Evaluation of Recent Surgical Updates Regarding Diagnosis and Management of Diverticulitis

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ABSTRACT

Diverticulosis occurs when small, bulging pouches (diverticula) develop in your digestive tract. When one or more of these pouches become inflamed or infected, the condition is called diverticulitis. Diverticula are small, bulging pouches that can form in the lining of your digestive system, although it was rare before the 20th century, diverticular disease is now one of the most common health problems in the western world. It's a group of conditions that can affect your digestive tract. The most serious type of diverticular disease is diverticulitis. It can cause uncomfortable symptoms and, in some cases, serious complications. If left untreated, these complications can cause long-term health problems. Read on to learn more about diverticulitis, including its causes, symptoms, treatment options, and how your diet might affect your risk of developing it.

Objective: In this paper, our main focus was on diverticulitis and surgical intervention, and only relevant studies were discussed.

Methodology: PubMed database was used for articles selection, and papers on diverticulitis were obtained and reviewed.

Conclusion: Colonoscopy is best avoided in acute and uncomplicated diverticulitis. Classically, it is a surgical disease but uncomplicated cases can often be managed conservatively. Follow up of treated diverticulitis occurs after four weeks via colonoscopy, in selected cases assessing the risk of developing colonic cancer. Novel therapies are under-studied and are probable replacements for surgical intervention.

Introduction

Diverticular disease is principally a condition that has become widespread in the 20th and 21st centuries, Alexis Littre, a French surgeon, first described it in the late 1700s [1]. Urbanization has led to increase the incidence of diverticulitis for example in Finland, the incidence of diverticulitis has risen 50% in the last two decades, largely in part to reduced dietary fiber and an aging population [2].

In western countries diverticulitis usually affect elderly people, but there is increasing in incidence of affecting people younger than 40, and usually the patient present with left colon affected which is the most common site of diverticulitis in western countries [3]. The incidence of diverticular disease has increased over the past century, autopsy studies from the early part of the 20th century reported colonic diverticula rates of 2% to 10% [3]. Diverticulitis is the most common complication of diverticulosis, which occurs in about 10% to 25% of patients [4]. This disease, especially if it developed into acute diverticulitis, needs hospitalization as it may be complicated by perforation of the bowels, ensuing peritonitis, and inevitable septic shock. These factors all add to the increasing health care expenditure overall. In this paper, we will review diverticular diseases, their pathophysiology, clinical features, and management (surgical and non-surgical) [5].

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Methodology

In this paper PubMed database was used for articles selection, and the following keys were used in the mesh ("Diverticulitis"[Mesh] and "Surgery"[Mesh]). In regards to the inclusion criteria, the articles were selected based on the inclusion of one of the following topics; diverticular disease features and surgery, maintenance, and operative management of diverticulitis. Exclusion criteria were all other articles that did not have one of these topics as their primary endpoint.

Discussion

Diverticulosis is defined by the presence of diverticula due to herniation of mucosa and muscularis mucosa through the muscularis propria at sites of vascular penetration in the colon and is asymptomatic in the vast majority affected. There are global differences of distribution, in western industrialized societies, the most common site is in the left colon, but in Asia right sided diverticulosis predominates. Whilst present in 17.5% of a general population and 42% of all comers at endoscopy it is seen in 71% of those aged ≥80 years [6]. Diverticulitis is the most common complication of diverticulosis, which occurs in about 10% to 25% of patients [4]. The pathophysiology of diverticulitis is the obstruction of the diverticulum sac by fecalith, which by irritation of the mucosa causes low-grade inflammation, congestion and further obstruction [7]. One of the main events that it is believed to be the main turning point in the development of diverticulitis is the obstruction of the neck of a diverticulum. This will have multiple consequences, such as, local ischemia, bacterial proliferation, and even may cause micro-perforation that may lead to disastrous complications [8]. Diverticulosis is multifactorial disease, but diet is essential factor colonic motility and resistance including decreasing fiber intake causing constipation resulting in diverticular disease [9]. Decreased colonic motility (constipation) was also suggested as a factor due to its rule causing multiple repeated micro trauma to the tissues and increased time of exposure of the diverticula to feces, and increasing chances of inflammation [10]. Constipation is no more considered the key driver of diverticulosis, but we have to take into consideration that occurrence of diverticulosis probably of multifactorial origin.

It is well known, acute diverticulitis (AD) shows significant sign of inflammation. However, its real pathogenesis is still unclear. Inflammation could play a pathogenetic role in explaining some finding, in particular in acute uncomplicated diverticulitis (AUD) [11]. TNFα, its overexpression in AD as well as CD is not regulated by the same gene superfamily 15 (TNFSF15), which is an immunoregulatory, antiangiogenic gene [12, 13]. A recent study found that not all TNFSF15 superfamilies are shared among these two diseases. In particular, the CD GAGGA haplotype was significantly associated with diverticulitis (p = 0 03) in all DD versus all control com- parison. A second haplotype, rs6478108 (A), rs6478109 (G), rs7869487 (A), and rs4263839 (G), was also associated with DD in that cohort (p = 0 025). A third haplotype, rs6478108 (A), rs6478109 (G), rs7848647 (G), rs7869487 (A), and rs4263839 (G), was demonstrated in the DD < 55 years versus control > 55 years' comparison (p = 0 045). This study demonstrates clearly that distinct but overlapping TNFSF15 haplotypes can be found in diverticulitis patients versus healthy controls when compared with the known CD haplotype suggesting similar but distinct genetic predispositions [14].

This study strengthens therefore the role for a genetic predisposition to diverticulitis that involves the TNFSF15 immunoregulatory gene, triggering the occurrence of inflammation as a consequence [15]. The role of colonic microbial imbalance. It has been hypothesized that microbial imbalance, which is known as dysbiosis, may be the trigger of inflammation (and therefore symptoms) in people having diverticulosis [16]. Clinical assessment encompassing history and physical examination are important in the diagnosis of diverticulitis for physicians.

A good clinical assessment alongside with history and physical examination aids in the diagnosis of diverticulitis for physicians. When examining diverticulosis patient, appropriate abdomen examination should be made, and tenderness of the left lower quadrant should alert the physician to acute diverticulitis. The clinical examination may reveal more signs such as abdominal distention, tympanic abdomen upon percussion, and hypo/hyper-active bowel sounds upon auscultation [17]. Differential diagnosis of diverticulitis mainly depends on it's location. Transverse colon diverticulitis may require to rule out acute pancreatitis and PUD. A great clinical examination, assessment of hemodynamic status of the patient and excluding differential diagnosis very helpful to lead the clinician to the right diagnosis. Moreover, appropriate physical examination helps in determining the stage of the disease, complications and management plan for example if the, the diverticulitis patient presented with abscess in addition risk of colorectal carcinoma [18]. Mainly helical CT scan is used due to its high sensitivity and specificity.

However, other modalities can be done in specific patients, like contrast enema which can be carried in uncomplicated patients, and plain x-ray which helps in identifications of critical complications such as perforation and obstruction. These radiological modalities have an increasing clinical rule in terms of diagnosis and even management, especially in the acute setting of the disease [13]. Colonoscopy is advised after an attack of acute diverticulitis in order to completely evaluate the colonic lumen and exclude a potential malignancy. However, it is a common practice to postpone colonoscopy until symptoms have fully subsided and perform it at least six week after discharge, in order to avoid the potential risk of converting a sealed perforation into a free perforation [20, 21]. Treatment of complicated diverticulitis in the acute setting depends on the patient's overall clinical condition and degree of peritoneal contamination and infection. The most commonly used grading system to describe the severity of complicated diverticulitis is the Hinchey classification (Table 1) [22].

Table 1: Hinchey classification.

Hinchey Classification	
1a	Pericolonic phlegmon and inflammation, no fluid collection
1b	Pericolonic abscess <4cm
2	Pelvic or inter-loop abscess OR abscess >4cm
3	Purulent peritonitis
4	Feculent peritonitis

It has been estimated that about 15-20% of all patients admitted with acute diverticulitis, both complicated and uncomplicated, will require surgical intervention during their initial admission [23-25]. Those with complicated diverticulitis are even more likely to require an operation during their initial hospitalization, upwards of 50% of the time [26].

Moreover, elective surgery is increasing, as most operations are in young age groups of the US [27]. For other patients, even an elective resection might be life-saving and quality-improving. This group mainly encompasses chronic renal injury, collagen-vascular disease, and patients on immunosuppressants [28]. These patients are very vulnerable to certain complications, especially when it comes to the risk of having a recurrent diverticular disease and even have a higher risk of perforation [28]. Recurrent diverticulitis would inevitably cause scarring and luminal obstruction. Some procedures may decrease the need for operative intervention, for example, percutaneous drainage. Salem *et al.* reported that percutaneous drainage in complicated diverticulitis decreased the odds of operative intervention [24].

Possibly fortunate news on this disease is pharmaceutical agents for the prevention of recurrent diverticulitis, including mesalamine, rifaximin, and probiotics. Unfortunately, statistical significance does not equate clinical evidence to include them in management protocols as of yet [29]. Diverticulitis is almost exclusively surgically managed, however, the gastroenterologists may still opt for medicinal management in selected cases. However, conservative management carries its own risk with patients commonly suffering from recurrence, especially if not properly treated and followed. On the other hand, surgery can be lifesaving in some patients and early identification of these patients is important. Surgical options include sigmoidal resection and even total colectomy in severe cases. The main indications for surgery include stenotic complaints, fistulas, and recurrent diverticular bleeding [30, 31].

Conclusion

Diverticulitis is common in developed worlds, due to lifestyle changes. Even though it was the disease of the elderly, now it affects the younger population in rising rates.it's multifactorial disease, but constipation was believed to be the main cause behind diverticulosis pathogenesis. The rule of a physician is very important for diagnosis and radiological modalities along with a colonoscopy, and all have major. Management of the patient differs based on the presentation, clinical setting, and available resources, ranging from observation, and antibiotics, lifestyle changes up to major surgeries. These topics may change our whole management protocols and understandings of this disease, helping physicians to provide even more optimal care for patients in the future.

Conflicts of Interest

None.

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Ethical Approval

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Author Contributions

Hamad Alsanea: assist in surgery, literature review, paper writing, editing , manuscript drafting and review.

Guarantor

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