Introduction

Disabling symptoms of pelvic discomfort and obstructed defaecation are frequently attributed to posterior pelvic floor disorders, such as enterocele and rectocele. Enterocele is defined as a herniation of the peritoneal sac between the vagina and the rectum. Unlike other types of pelvic organ prolapse, enterocele is a true herniation with a peritoneal sac containing small bowel or sigmoid colon. The first description of enteroceles is attributed to Garengeot in 1736 [1].

Prevalence

Enteroceles are most frequently found in elderly, multiparous females. The exact prevalence of this abnormality still remains unclear. In a review from 1994, Holley stated that enteroceles are uncommon [2]. According to other authors, the prevalence of an enterocele among patients with pelvic floor dysfunction varies between 11 and 45% [3,4]. A substantial number of enteroceles are found after hysterectomy. Evacuation proctography revealed an enterocele in up to 18% of women who underwent hysterectomy [5] and in 10% of healthy female volunteers [6,7]. Almost two-third of the women with a symptomatic enterocele had undergone prior hysterectomy [8,9].

Etiology

The exact cause of enterocele is probably multifactorial. In the past, it has been suggested that failure of fusion of the anterior and posterior peritoneum in the pouch of Douglas during late fetal development contributes to the formation of enteroceles [10]. Frequent and prolonged straining at stool might result in stretching and laceration of the pelvic floor and supporting ligaments [10,11]. It has been suggested that atrophy of the pelvic floor and lack of female hormones in elderly females result in less support of the pelvic floor, contributing to the formation of an enterocele. Finally, alterations in pelvic anatomy, for example after hysterectomy, are considered to be a contributing factor [12,13].

Symptoms

It is well known that enteroceles are associated with symptoms of pelvic discomfort, such as feelings of prolapse and pelvic pain or pressure [4,12,13]. Patients encounter these symptoms especially in a standing position and during increased intra-abdominal pressure. According to some authors, enterocele is considered an important cause of...
obstructed defaecation, especially enterocele containing sigmoid colon [4,14]. Although many women with an enterocele present with symptoms of obstructed defaecation, it is still questionable whether enterocoeles contribute to obstructed defaecation or not. Chou et al. examined 310 female patients who underwent surgery for pelvic organ prolapse or urinary incontinence or both [15]. The signs and symptoms in 77 women with an enterocele were compared with those observed in 233 females without an enterocele. They found no difference in bowel function between both groups (infrequent bowel movements, straining, manual evacuation and fecal incontinence). It seems unlikely that the symptoms, characteristic for an enterocele, can be defined since many patients with an enterocele have concomitant abnormalities, such as rectocele and intussusception [4,9].

Diagnosis

In the past enterocoeles could only be diagnosed by bidigital, vaginal and rectal examination, preferable with the patient in the standing position. However, Kelvin et al. reported that not all enterocoeles could be detected by physical examination [16]. They examined 74 female patients with symptoms of pelvic organ prolapse and demonstrated that the majority of enterocoeles revealed by evacuation proctography were missed by physical examination. This finding illustrates that evacuation proctography, with opacification of the small bowel and vagina, is a more reliable tool in diagnosing an enterocele (Fig. 1). Table 1 displays the grading of enterocoeles as visualised by evacuation proctography. Furthermore, imaging techniques, such as cystography and colposcopic defaecography, enable the detection of concomitant abnormalities in the other two pelvic compartments [4,9]. Recently, other, less invasive imaging techniques for examination of the pelvic floor have been introduced, such as dynamic magnetic resonance imaging and dynamic transperineal ultrasound [17–19]. Despite promising reports, further research is warranted to determine the value of these new imaging techniques in the evaluation of patients with symptoms of pelvic organ prolapse.

Surgical treatment

Various procedures, either transabdominal or transvaginal, have been developed for the surgical treatment of symptomatic enterocoeles. The founder of enterocoele repair was Moschowitz [20]. In 1912, he was the first to describe an abdominal obliteration of the pouch of Douglas. He used six to eight non-absorbable sutures placed in a concentric pattern, beginning at the most distal part of the cul-de-sac and continuing until the entire pouch of Douglas was obliterated. Despite this procedure has formed the cornerstone of transabdominal repair for many decades, data regarding the outcome of this type of repair are scarce.

In 1922, Ward was the first to describe a transvaginal approach which became very popular among gynaecologists [21]. His technique consisted of a midline dissection of the posterior vaginal wall, excision with ligation of the enterocoele and reapproximation of the uterosacral ligaments as close to the rectum as possible, in order to obliterate the cul-de-sac of Douglas. Five observational studies from the last two decades do suggest that a transvaginal approach results in a good anatomical repair [22–26]. However, in all these studies the efficacy of the procedure has only been assessed by physical examination and not by means of evacuation proctography. Furthermore, data regarding the long-term efficacy of the repair concerning associated symptoms are lacking. The use of both uterosacral ligaments requires peritoneal entry, which carries a possible risk of urethral injury. Another drawback of a transvaginal repair is the potential risk of de novo dyspareunia.

In the last decade, more advanced transabdominal repair techniques utilizing synthetic graft material are reported. In 1998, Silvis et al. [27] described a rectovaginovesicopexy in patients with combined defaecation and miction disorders. After 3 months, an evacuation proctography was performed. Ninety percent of enterocoeles were successfully restored by this novel abdominal approach. In a study from 1999, Gosselink et al. [12] reported that complete obliteration of the pelvic inlet with a U-shaped Mersilene® mesh was highly efficient for patients with an enterocoele. Anteriorly, the mesh was sutured to the apex of the vagina and posteriorly to the presacral fascia at the level of the promon-

<table>
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<th>Grade</th>
<th>Description</th>
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<td>1</td>
<td>Enterocele descending to the upper one-third of the vagina</td>
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<tr>
<td>2</td>
<td>Enterocele descending to the middle one-third of the vagina</td>
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<tr>
<td>3</td>
<td>Enterocele descending to the lower one-third of the vagina</td>
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Figure 1  Evacuation proctography revealing an enterocele, grade 3.
tory, thereby resulting not only in obliteration of the pelvic inlet but also in a sacral colpocpy. Recently, we reported the long-term results of this abdominal repair technique [28]. Obliteration of the pelvic inlet provides an effective tool for anatomical correction of enteroceles. However, on the long-term, 25% of the patients encountered recurrent symptoms of pelvic discomfort and obstructed defaecation persisted in 75% of the women. Similar, results have been reported by Jean et al. [13] who performed a quite similar technique.

Recently, two reports do suggest that laparoscopic enterocele sac excision and vaginal vault suspension also provides a good anatomical correction [29,30]. Further research should define the efficacy and the advantages and disadvantages of this laparoscopic approach on the long-term.

**Author’s preferred method of treatment**

The most appropriate surgical approach for the treatment of enteroceles is still controversial. The limited evidence that exists at present suggests that an abdominal approach, utilizing synthetic graft material, provides a more durable support than a transvaginal repair. However, none of the reported studies were randomized-controlled trials comparing two different surgical techniques. There is also a lack of consensus about the indications for enterocele repair and the need for concomitant surgery for associated abnormalities. In our opinion, surgical repair in patients with an enterocele should mainly depend on the patient’s symptoms. If obstructed defaecation is the most prominent complaint, repair seems to be not useful. Regarding pelvic discomfort repair can be considered. However, an enterocele should be considered as a part of a spectrum of pelvic floor disorders. Therefore, concomitant forms of pelvic organ prolapse should be diagnosed in all patients.

**References**