

Acute appendicitis and endometriosis: retrospective analysis in emergency setting

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SUMMARY: Acute appendicitis and endometriosis: retrospective analysis in emergency setting.

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Introduction. *The aim of this study is to evaluate the incidence of appendiceal and pelvic endometriosis in a population with diagnosis of acute appendicitis in an emergency setting.*

Materials and methods. *We carried out a retrospective study in the period between January 2010 and October 2013. We performed 429 appendectomy including 233 in female subjects (54.3%). In all patients of childbearing age, we did β -hCG urine test to rule out the presence of an extra-uterine pregnancy.*

Results. *127 of 233 patients received a laparoscopic approach (54.5%). The median age was 29 years-old (range 17-68). The diagnosis of appendiceal and/or pelvic endometriosis was performed in 10 patients (4.3%): 9 treated in laparoscopy and only 1 treated in open. In only one case was required conversion to open surgery. We diagnosed appendiceal endometriosis in 3 patients, pelvic endometriosis with consensual acute appendicitis in 5 cases, pelvic endometriosis in the absence of macroscopic changes of the appendix in one case, sigmoid endometriosis in one case. There were no intraoperative complications, wound's complications or intra-abdominal abscesses.*

Conclusions. *In general female population with clinical, laboratoristic and instrumental diagnosis of acute appendicitis and without anamnestic suspicion of gynecological pathology, it is always good to consider the hypothesis of pelvic and/or appendiceal endometriosis. The laparoscopic approach should be considered the treatment of choice for these patients in an emergency setting.*

RIASSUNTO: Appendicite acuta ed endometriosi: analisi retrospettiva in emergency setting.

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Introduzione. *Lo scopo di questo studio è valutare l'incidenza di endometriosi appendicolare e/o pelvica in una popolazione di soggetti con diagnosi di appendicite acuta.*

Materiali e metodi. *Abbiamo condotto uno studio retrospettivo nel periodo tra gennaio 2010 e ottobre 2013. In totale sono stati eseguiti 429 interventi chirurgici di appendicectomia di cui 233 in soggetti di sesso femminile (54,3%). In tutte le pazienti in età fertile abbiamo eseguito il dosaggio della β -hCG urinaria per escludere la presenza di una gravidanza extra-uterina.*

Risultati. *Su 233 pazienti, 127 sono state trattate con approccio laparoscopico (54,3%). L'età media era di 29 anni (range 17-68 anni). La diagnosi di endometriosi appendicolare e/o pelvica è stata effettuata in 10 pazienti (4,3%) di cui 9 trattate in laparoscopia e solo 1 appartenente al gruppo trattato in open. In un solo caso è stata necessaria la conversione in open. In 3 pazienti abbiamo diagnosticato endometriosi appendicolare e pelvica; in 5 casi endometriosi pelvica con consensuale patologia flogistica appendicolare; in un caso endometriosi pelvica in assenza di alterazioni macroscopiche dell'appendice; in un caso endometriosi del sigma. Non si sono verificate complicanze intraoperatorie, complicanze di ferita, né ascessi intra-addominali.*

Conclusioni. *Nella popolazione femminile generale che giunge in urgenza con diagnosi clinico-laboratoristico-strumentale di appendicite acuta e senza sospetto anamnestic di patologia ginecologica, sarebbe sempre bene considerare l'ipotesi di una possibile localizzazione endometriosa pelvica o appendicolare ed eventualmente trattarla nel corso dello stesso intervento chirurgico. L'approccio laparoscopico dovrebbe essere considerato il trattamento di scelta per queste pazienti.*

KEY WORDS: Appendiceal endometriosis - Acute appendicitis - Endometriosis - Laparoscopy - Laparoscopic appendectomy - Appendectomy.

Endometriosi appendicolare - Appendicite acuta - Endometriosi - Laparoscopia - Appendicectomia laparoscopica - Appendicectomia.

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Background

Appendicitis is one of most common acute surgical conditions of the abdomen, and an appendectomy is one of the most frequently performed operations (1). The incidence of negative appendectomies has been reported to be on the decline over the past 10 years with the increase use of imaging adjuncts such as ultrasonography and computed tomography (CT) scans preoperatively (2). Laparoscopy is also an useful diagnostic adjunct (3). This approach allows a complete exploration of the peritoneal cavity and pelvic organ that is particularly advantageous in certain categories of patients, including young women of childbearing age, to perform differential diagnosis with gynecological diseases (4). Endometriosis, defined as the presence of endometrial glands and stroma outside the uterine cavity and musculature (5) is estimated to affect 4-50% of reproductive aged woman and results in pelvic pain and infertility in up to 50% of these patients (6). The symptoms are closely related to the site of the lesions, so in addition to the typical clinical features of the pelvic and vaginal locations, the endometriosis of the gastro-intestinal tract may cause a wide array of symptoms (7, 8). Appendiceal endometriosis was first described in 1860 by von Rokitsansky (9). Over the years, numerous studies have been performed on this topic and the various authors report the prevalence of appendiceal endometriosis of 0.8-22% depending on the cohort of examined patients (10). In this study, we considered patients with lesions localized in the appendix and/or pelvis that came to our observation with clinical and radiological diagnosis of acute appendicitis.

Materials and methods

Study design

We carried out a retrospective study in the period between January 2010 and October 2013. We performed 429 appendectomies including 233 in female subjects (54.3%). Of these 233 patients 204 came to our observation in an emergency setting with acute abdominal pain in the right iliac fossa and/or lower abdominal quadrants, without alterations of the menstrual cycle. These patients made blood exam, with detection of neutrophilic leukocytosis, and instrumental imaging (abdomen ultrasonography). In all patients of reproductive age, we did β -hCG urine test to rule out the presence of an extra-uterine pregnancy (11). The remaining 29 patients had a clinical presentation rather nuanced and equivocal, with pain localized in the epigastrium

and/or lower abdominal quadrant, diarrhea and dysmenorrhea. In these cases, we performed a pre-operative diagnostic study with esophagus-gastro-duodenoscopy or colonoscopy, as appropriate, and transvaginal gynecological ultrasonography (12). These investigations allowed us to exclude specific diseases such as inflammatory bowel diseases or gynecological disorders. For the persistence of clinical symptoms, despite medical therapy administered, these patients were then undergone to laparoscopic appendectomy.

Surgical technique

When we perform an open appendectomy we use the traditional McBurney incision or right pararectal incision. In case of laparoscopic appendectomy patients are positioned in slight Trendelenburg tilt on left side. Both the first that the second surgeon are placed on the left of the patient. We induce pneumoperitoneum to 12 mmHg using Hasson's technique via trans-umbilical open laparoscopy and positioning 10 mm optical trocar (13, 14). A 5 mm port is placed in left flank, along the midclavicular line (operator trocar), an another 5 mm port is placed in sovrapubic region along middle line. In all patients we place the bladder catheter that is removed at the end of operation. In all the patients who underwent laparoscopic appendectomy we carried out a meticulous exploration of the pelvic cavity and uterus as well as the exploration of the last 60 cm of ileum (15). The diagnosis of endometriosis was confirmed by direct visual inspection of the typical pigmented lesions confirmed by microscopic pathology. All visible lesions and adhesions were treated by bipolar coagulation. Except for one patient, we always made appendectomy.

Results

127 of 233 patients received a laparoscopic approach (54.5%). The median age was 29 years-old (range 17-68). The diagnosis of appendiceal and/or pelvic endometriosis was performed in 10 patients (4.3%): 9 treated in laparoscopy and only 1 treated in open. In only one case was required conversion to open surgery for sigmoid endometriosis. We diagnosed appendiceal endometriosis in 3 patients, pelvic endometriosis with consensual acute appendicitis in 5 cases, pelvic endometriosis without macroscopic changes of the appendix in one case, sigmoid endometriosis in 1 case (initial laparoscopic approach and subsequent conversion to open). Table 1 shows the characteristics of patients with the related diagnoses and performed procedures. There were

no significant intraoperative blood loss nor blood transfusions were performed. We placed an abdominal drain in the patient with recurrent appendicitis and abscess and in the patient with endometriosis nodule of the sigmoid colon. There were no intraoperative complications, wound's complications or intra-abdominal abscesses. Currently, we found no cases of endometriosis on previous surgical scar or in the navel (16).

Discussion

Endometriosis is a disease common to reproductive-aged women and occasionally affects the appendix. From a review of the literature the rate of appendiceal endometriosis ranged from 2.8% to 5.0% (17). However, this rate is calculated on a selected population of women with chronic pelvic pain and suspected diagnosis of endometriosis (18). In fact, if

we consider the general population, as in our case, the percentage of appendiceal endometriosis falls to 0.4% (19). In this study we considered a non-selected sample of female patients who came to clinical attention with clinical suspicion of acute appendicitis. We performed an intraoperative diagnosis of endometriosis (pelvic and/or appendicular) in 4.3% of cases. If we consider only the patients with a diagnosis of appendiceal endometriosis, the percentage falls to 1.3%. This rate, however, is higher than that reported in the literature (17, 19). Our data offer several considerations. First, in the general female population that comes in urgency with clinical, laboratoristic and instrumental diagnosis of acute appendicitis and without anamnestic suspicion of gynecological disorders, it is always recommended to consider the hypothesis of a possible endometriosis location (pelvic and/or appendicular) and possibly treat it in the same surgery time (20). The laparoscopic approach allows a wide diagnostic exploration of the

TABLE 1 - CHARACTERISTICS OF PATIENTS WITH CLINICAL AND INSTRUMENTAL DIAGNOSIS OF ACUTE APPENDICITIS AND INTRAOPERATIVE CONFIRMATION OF ENDOMETRIOSIS. WE SHOW THE DIFFERENT TYPES OF TREATMENT AND THEIR OPERATIVE TIMES. LA: LAPAROSCOPIC APPENDECTOMY; OA: OPEN APPENDECTOMY.

Patient	Age	Intraoperative findings	Procedure	Operation time	Co-morbidity
1	32	Acute appendicitis and pelvic endometriosis	LA, endometriosis coagulation	75 min	
2	31	Acute appendicitis and pelvic endometriosis	LA, endometriosis coagulation	60 min	
3	20	Pelvic endometriosis, mesenteric lymphadenopathy	Endometriosis excision, lymph node biopsy	40 min	Celiac disease
4	65	Appendiceal endometriosis	LA	45 min	Diverticular sigmoiditis
5	19	Acute appendicitis and pelvic endometriosis	LA, endometriosis coagulation	60 min	
6	19	Appendiceal and pelvic endometriosis	LA, endometriosis coagulation	95 min	
7	32	Appendiceal, ovaric and pelvic endometriosis	LA, endometriosis toilette	60 min	Chron's disease
8	24	Acute appendicitis and pelvic endometriosis	OA, endometriosis coagulation	45 min	
9	45	Recurrent appendicitis with abscess, ovaric and pelvic endometriosis	LA, endometriosis toilette	120 min	
10	55	Chronic appendicitis, visceral endometriosis (sigmoid colon)	Conversion to open, appendectomy, excision of endometriotic nodule	100 min	

pelvic organs that instead is difficult in open surgery (21, 22). The highest percentage of endometriosis observed in our study could be attributed to the increasing use of the laparoscopic technique rather than a bias in the diagnostic phase. As evidence of this the fact that all patients with intraoperative and histological diagnosis of pelvic and/or appendiceal endometriosis had pre-operative effusion fluid in the pelvic cavity, although the data are not statistically significant due to the limited number of patients (23, 24). Another consideration should be made instead on the possibility of an appendectomy even in patients with macroscopically normal appendix and intra-operative feedback of other gynecological pathology. The problem is even greater if we consider those cases of recurrent appendicitis in which the symptoms are more nuanced. In our experience, in all patients treated in urgency we performed a simultaneous appendectomy. We didn't perform appendectomy just in case #3, when the detection of pelvic endometriosis, the normal macroscopic appearance of the appendix together and the unclear clinical symptoms, there has led to take a conservative approach. All patients with intraoperative confirmation of endometriosis were subsequently assigned to the care of gynecologist (25, 26).

Conclusions

The appendiceal endometriosis is an uncommon disease in patients with endometriosis and even more rare in the general female population. The

most common sites where endometriosis occurs are the ovaries (60-75%), uterosacral ligaments (30-65%), cul-de-sac (20-30%), gastrointestinal tract (3-37%), ureters (1-2%), bladder, diaphragmatic muscle and surgical scars (<1%) (27-30). The differential diagnosis of intestinal and appendiceal endometriosis includes inflammatory bowel disease with stricture, diverticulitis, infectious disease and colon ischemia (31, 32). Patients with appendiceal endometriosis can present symptoms of acute appendicitis, appendix invagination, nausea, melena and aspecific abdominal pain (33). It is important to emphasize that no radiologic or imaging findings is pathognomonic for endometriosis (34). A definitive diagnosis of endometriosis is often made by laparoscopy or laparotomy with a biopsy and is particularly useful in patients with intestinal implants. The classic peritoneal implant appears as a bluish-black "powder-burn" lesion with variable degrees of pigmentation and surrounding fibrosis, the dark coloration resulting from deposition of hemosiderin. However, most peritoneal implants appear as subtle, nonpigmented lesions (35).

In all cases of fertile women which are placed in the emergency diagnosis of acute appendicitis should also be considered the possibility of endometriotic lesions. In our experience, the majority of women with intraoperative findings of pelvic and/or appendiceal endometriosis showed no irregularities of the menstrual cycle. The laparoscopic approach, with the possibility of a better exploration of the pelvic cavity, should be considered the treatment of choice for these patients.

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