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Ovarian Damage after Laparoscopic Cystectomy for Endometrioma

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Rezumat

Impactul nefavorabil asupra ovarului al chistectomiei laparoscopice a endometrioamelor

Introducere: În pofida numeroaselor studii care îi sunt dedicate, endometrioza rămâne o patologie enigmatică şi mai ales controversată, atât în privinţa etiopatogeniei cât şi a managementului. Ultimul ghid clinic european publicat de ESHRE în 2014 subliniază că din cele 83 de recomandări emise, în 32 de situaţii aceste recomandări nu au putut fi bazate pe dovezi clinice robuste şi de bună calitate, subliniind astfel nevoia de studii clinice în continuare. În Romania prevalenţa endometriozei nu este exact cunoscută, literatura mondială estimând un procent de 2-10% din populaţia feminină de vârstă reproductivă, respectiv 50% în cazul pacientelor cu infertilitate. Endometrioamele ovariene reprezintă a treia localizare ca frecvenţă a endometriozei, cu o prevalenţă de 44% iar în privinţa tratamentului acestora tratamentul actual cel mai recomandat este excizia capsulei endometriomului. Această tehnică se asociază cu ameliorarea durerii şi rate de sarcini mai bune decât conduita care presupune drenajului chistului şi electrocoagularea peretelui. Numeroase studii însă atrag atenţia asupra pierderii de masă ovariană sănătosă după această tehnică chirurgicală.
Material şi metodă: Scopul studiului nostru este să analizăm impactul diferitelor tehnici chirurgicale asupra pierderii de ţesut ovarian sănătos după chirurgia laparoscopică a endometrioamelor ovariene. În acest sens am făcut o analiză retrospectivă a 202 cazuri de endometrioame ovariene operate pe cale laparoscopică într-un serviciu universitar de ginecologie. Intervenţia chirurgicală a constat în 152 de cazuri în chistectomie, respectiv în 60 de cazuri în drenajul chistului şi ablaţia electrică a cămăşii chistului. Rezultatele noastre arată că prezenţa de ţesut ovarian indemn pe piesele operatorii de chistectomie a fost de 40% în condiţiile în care examenul microscopic nu s-a făcut cu scopul intenţionat de a căuta acest ţesut ovarian sănătos, respectiv intervenţia chirurgicală s-a efectuat cu scopul declarat de a nu leza ovarul, majoritatea pacientelor operate fiind infertile.
Discuţii: Studiul nostru doreşte să atragă atenţia asupra impactului nefavorabil al unei tehnici chirurgicale foarte utilizate la acest moment şi care este considerată standardul de urmat la ora actuală. Paradigma chirurgiei endometriomului ovarian s-ar putea schimba odată cu apariţia în literatură a rezultatelor unor noi tehnici şi tehnologii (laser, energie plasma). Aceste date merită toată atenţia noastră şi probabil ele vor conduce la reorientarea tratamentului şi a informării pacientelor în viitorul apropiat.

Cuvinte cheie: endometrioză, laparoscopie, rezervă ovariană

Abstract

Introduction: Despite extensive research endometriosis is an area with important controversies. The European Society of Human Reproduction and Embriology issued in 2014 the last Guideline for endometriosis management including the statement that among 83 recommendations in 32 cases the best available evidence was only based on good clinical practice, further research being necessary to solve the lack of evidence in this pathology. The prevalence of endometriosis

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is unknown in Romania but in the medical literature estimates range from 2 to 10% of women of reproductive age, to 50% of infertile women, worldwide. Ovarian endometrioma prevalence goes up to 44%. A Cochrane review published in 2008 by Hart et al. concluded that excisional surgery of ovarian endometriosis results in a more favorable outcome compared to drainage and ablation with regard to recurrence, pain symptoms and subsequent spontaneous pregnancy in subfertilewomen- so the gold standard was set. But several authors revealed that ovarian tissue was inadvertently excised together with the cyst wall and endometrioma cystectomy is associated with a significant decrease in residual ovarian volume that may result in diminished ovarian reserve and function. The aim of our retrospective study was to evaluate whether or not ovarian parenchyma is inadvertently removed during laparoscopic surgery for endometrioma in a Romanian academic center.
Material and method: We performed a retrospective study including women having undergone endometrioma excision, between January 2009 to June 2014 in the Department of Gynecology and Obstetrics of Targu-Mures University Hospital. Histological specimens of excised endometriomas were reviewed by different pathologists, who carried out serial microscopic sections according to pathology protocol for diagnosis of ovarian mass but not specific for the ovarian parenchyma removed with the cyst.
Results: Among 202 endometriomas, drainage and ablation was done in 60 cases and excisional surgery in the remaining 152 cases. Ovarian parenchyma was found in 40% of cases of endometrioma cystectomy.
Discussion: We observed that endometrioma cystectomy leads to ovarian tissue removal in an important number of cases. Furthermore, at the time of surgery the amount of ovarian parenchyma loss may increases proportionally with increases in cyst diameter and patient age. Considering that most of the woman in our series were infertile and because of data from series using plasma energy, a shift in the endometrioma treatment paradigm is likely to occur.

Key words: endometriosis, laparoscopy, ovarian reserve

Introduction

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The prevalence of endometriosis is unknown in Romania but in the medical literature estimates range from 2 to 10% of women of reproductive age, respectively 50% of infertile women, worldwide. Ovarian endometrioma prevalence goes up to 44%. (3-5)

A Cochrane review published in 2008 by Hart et al. concluded that excisional surgery of ovarian endometriosis results in a more favorable outcome compared to drainage and ablation with regard to recurrence, pain symptoms and subsequent spontaneous pregnancy in subfertile women (6) - so the gold standard was set. But several authors revealed that ovarian tissue was inadvertently excised together with the cyst wall and endometrioma cystectomy is associated with a significant decrease in residual ovarian volume that may result in diminished ovarian reserve and function. (7-11)

The aim of our retrospective study was to evaluate whether or not ovarian parenchyma is inadvertently removed during laparoscopic surgery for endometrioma in a Romanian academic center.

Material and Method

We performed a retrospective study including women having undergone endometrioma excision, between January 2009 to June 2014 in the Department of Gynecology and Obstetrics of Targu-Mures University Hospital. Histological specimens of excised endometriomas were reviewed by different pathologists, who carried out serial microscopic sections according to pathology protocol for diagnosis of ovarian mass but not specific for the ovarian parenchyma removed with the cyst.

Demographic data, medical history and symptoms, such as dysmenorrhea, dyschezia, chronic pelvic pain, dyspareunia, or presence of infertility, were documented in each patient using the patients medical record and operative reports.

Preoperatively all patients underwent transvaginal ultrasound examination (5–7.5 Mz transvaginal transducer) to record the dimension of endometrioma and to rule out functional or malignant suspected cysts. For cyst diameter, the mean diameter of the three perpendicular dimensions of the ovary was considered.

Operative laparoscopy was performed through insertion of a 10-mm intraumbilical trocar and three 5-10 mm trocars in the lower abdomen and the tissue-sparing technique was always used (10): after identification of the cleavage plane, the wall of the cyst was stripped from the healthy surrounding normal ovarian tissue with the use of two atraumatic grasping forceps by traction and countertraction, and sent for histologic examination. Finally, hemostasis was achieved with application of a 30-W current using bipolar forceps on the cyst bed. Peritoneal endometriotic implants were electrocoagulated as well with a power setting of 15 W.

In all patients the preoperative diagnosis of endometrioma was confirmed during the initial diagnostic laparoscopy. This included inspection of pelvic and peritoneal organs, peritoneal, staging of endometriosis, and adhesiolysis to fully release the ovarian adhesions from the surrounding structures, if necessary. Endometriosis was staged according to the revised American Society for Reproductive Medicine (ASRM) classification.

None of the patients required conversion of the laparoscopic procedure to laparotomy and no intraoperative or post-

operative complications occurred.

Statistical analysis was performed using Stata 11.0 Software (Stata Corporation, 4905 Lakeway Drive, TX, USA). Median values, percentiles, mean values and SD were calculated for continuous variables, and numbers and percentages for categorical variables.

A multivariate model was used to identify the independent predictors of ovarian parenchyma removed. A P-value inferior to 0.05 was considered to be statistically significant.

Results

Among 202 consecutive cases of ovarian endometriomas, drainage and ablation was done in 60 cases and excisional surgery in the remaining 152 cases. Microscopic examination of surgical specimen shows that normal ovarian parenchyma was inadvertently excised during laparoscopic cystectomy in 40% (n= 61) of cases.

In total, 152 ovarian endometriomas were managed by cystectomy following the procedure described above and particular care was taken to spare ovarian tissue during the procedure.

The patients mean age was 31,5 years (range 18-52). In 21 cases (14%), endometrioma cystectomy was performed for reccurence after previous surgery.

In 61 cases (40%), the cyst was located on the left ovary and in 60 cases (39.5%) % on the right ovary. Thirty two women (20,5%) presented with bilateral ovarian cysts. The mean diameter of endometriomas was 4.70 cm (SD=0,15 cm). Regarding endometriosis extension 25 patients (16.5%) were classified rAFS stage II, 56 patients (36,8%) were classified rAFS stage III, and 8 patients (5,3%) were classified rAFS stage IV. Pelvic adhesion were found in 66 (43.4%) cases.

In this group 81 patients (53%) reported future pregnancy wish.

There were no statistical significant relationships between the presence of ovarian parenchyma removed and respectively bilateral endometrioma (P=0.66), and infertility status (P= 0.59) despite a 35.4% rate of identification during microscopic examination.

We observed a statistical significance between age (under 35 years old patients) and an increase in the rate of ovarian parenchyma removed (P=0.004).No significant relationship was found between presence of adhesions and the presence of ovarian parenchyma removed (P=0.18).

Conversely, there was a significant statistical relationship between the presence of ovarian parenchyma and endometrioma cyst diameter greater than 5 cm.

Discussion

Laparoscopic cystectomy for endometriomas is a popular practice among gynecologic surgeons. A survey among 388 UK gynecologist revealed that ovarian cystectomy was the most common surgical technique, been used by 68% of responders. (12)

The surgical technique of endometrioma excision has been previously described by other authors as being an ovarian tissue sparing procedure (8,10,13) and it takes into account the physiopathologic theories of the development of endometriomas proposed by Nisolle and Donnez that states that endometriomas originate from the metaplasia of celomic epithelium invaginated into the ovarian cortex, a theory which fits 100% of cases of ovarian endometriomas. (14)

Physiopathology understanding is of major importance for surgeons because suggest that the excision of an endometrioma does not require antimesial incision of the ovarian parenchyma, as it can be performed through a small area of the cyst, free of ovarian tissue. (10)

In this regard the tissue-sparing approach is reccommended because the absence of a cleavage plane due to endometriosis-induced fibrosis. This often leads to inadvertent removal of an amount of the adjacent ovarian cortex and serious bleeding at the ovarian hilus requiring extensive application of bipolar electrocoagulation and hence, adverse changes in ovarian blood supply, as well as a functional loss in the ovarian reserve. (15,16)

The damage of ovarian tissue was also confirmed by several pathological studies of the cyst capsule after the application of different laparoscopic stripping techniques of endometriomas. These analyses reached the conclusion that stripping was associated with inadvertently excision of normal functioning ovarian tissue, especially close to the ovarian hilus. (8, 17) Other studies even correlated the severity of ovarian reserve depletion to the ease of capsule removal during stripping. (18)

To reduce the damage to the ovarian reserve caused by cystectomy, in addition to improve surgical skills, surgeons should also pay attention to the relevant factors that affect the damage. In this study, the size of the endometrioma and the patients age were both positively related to the rate of ovarian tissue removed. This result suggested that the removal of relatively large endometriomas (> 5 cm) in infertile patients over 35 years old would cause relatively significant damage to the ovarian reserve. Because of the unclear boundaries between the endometrioma and surrounding ovarian tissue, when the endometrioma is large, the contact area with normal ovarian tissue is also large. Consequently, during the surgical removal of the endometrial cyst, it is more likely that a greater amount of the surrounding normal ovarian tissue of the cortex will be removed, causing greater damage to the ovarian reserve.

We were unable to demonstrate that repeteated laparoscopic stripping of recurrent ovarian endometriomas is associated with a high risk of ovarian reserve damage and ovarian failure because of a larger amount of ovarian tissue loss, as previously reported in the literature. (19)

Given the frequency of ovarian endometriomas, the heterogenicity and the limitations of the available studies, additional well-designed trials are needed to address this complicated issue of the most effective treatment of ovarian endometriomas taking into consideration not only the relief of symptoms, the cyst recurrence, and pregnancy rate, but also the ovarian function and reserve after surgery. (20) More important, the quality of the removed ovarian tissue should also be considered because according to recent reports the quality of

oocytes recovered from the ovary with a history of laparoscopic excision of endometrioma is not inferior to the quality of oocytes from contra-lateral healthy ovary. (21)

With the advent of new technologies, especially after using plasma energy associated with similar preganacy rates and endometrioma recurrence, infertile patients may benefit to a greater extent from plasma ablation than from cystectomy. (22)

There are several inherent methodological limitations of a retrospective study with no power calculation. In the present study, we assessed only if ovarian tissue was removed with the ovarian endometrioma during routine pathological examination. In this regard we think that an active, systematic search for ovarian tissue removed during cystectomy for endometrioma would find a much higher rate of inadvertently removed ovarian tissue.

Further prospective studies should be necessary to confirm the present findings and to investigate if there is any association between the amount of removed normal ovarian tissues and ovarian reserve after laparoscopic cystectomy.

Regardless, care should be taken to minimize the removal of normal ovarian tissue, particularly in patients with pregnancy wish and the surgeon must weigh the necessity for adequate excision against the potential iatrogenic decrease in ovarian reserve.

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