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## **Tubo-ovarian abscess management in our clinic**

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## ORIGINAL PAPER/GYNECOLOGY

### **Tubo-ovarian abscess management in our clinic**

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#### **ABSTRACT**

**Objectives:** It is aimed to examine and determine the sociodemographic, clinical parameters and ultrasonographic (USG) findings and to make various predictions about patients who will need tube-ovarian abscess (TOA) surgery.

**Material and methods:** Within the scope of the study conducted between April 2016 and March 2021, 140 patients diagnosed with TOA were evaluated. The parties in the comparison were compared based on clinical and USG findings of demographic characteristics of the patients who received medical and surgical treatment and those who received only medical treatment.

**Results:** Ninety-eight (72.05%) patients whose surgical and medical treatment required underwent laparotomy, laparoscopy, and USG-guided drainage. The most important potential hazards for surgical procedures include severe abdominal pain, extent of abscess, and length of hospital stay. Critical threshold for a surgical procedure is when

the abscess size becomes 5.5 cm (95% CI: 0.686–0.855, 0.686–0.855,  $p < 0.05$ ). In the USG-guided drainage group no other complications were noticed.

**Conclusion:** The size of the abscess is a valuable indicator of whether surgical treatment is required to manage TOAs and the USG-guided drainage led to fewer complications.

**Key words:** surgery; ultrasonography; tubo-ovarian abscess (TOA); abscess size

## INTRODUCTION

The process that occurs as an infectious mass of adnexal organs after pelvic inflammatory disease (PID) is called tubo-ovarian abscess (TOA). This condition can also be described as an inflammation in the upper genital tract as a result of bacterial infection, which usually occurs in women [1]. TOA, seen in 10–15% of female patients under the influence of PID, is a complication of PID that threatens vital functions [2]. Although upper genital tract infections lead to TOA, they may also develop after complicated diverticulitis or perforated appendicitis [3]. Peptococcus, Bacteroides and E. Coli bacteria can be shown among the most frequently seen pathogenic bacteria in TOA [4].

Optimal management within patients with TOA remains controversial. Thus, there is no consensus on this topic, and identifying the predictors of medical treatment failure is essential. In recent years, many patients with TOA have been deemed to require surgical treatment. Many studies investigated which parameter is the most determining, such as age, count of white blood cell, and size of abscess, have been assessed as a predictor for surgical treatment. Unfortunately, which parameter is the most determining remains unknown. The main objective of this work is to evaluate patients with TOA or pelvic abscesses to identify demographic characteristics, clinical and laboratory parameters, and USG morphology.

## MATERIAL AND METHODS

The research was done at the “Department of Gynecology and Obstetrics, Kanuni Sultan Suleyman Training and Research Hospital”, between April 2016 and March 2021, in

patients suffering from at least one of the diagnoses of pelvic abscess or TOA. The inclusion criteria were symptoms of infection, a pelvic mass  $\geq 25$  mm radiological assessment, cervical motion, uterine, adnexal or abdominal tenderness, and peritoneal signs.

All patients with TOA underwent physical checkup and pelvic inspection and blood tests were conducted before antibiotics. All the patients are treated with IV antibiotics (binary and triple) for a minimum of three days and intrauterine devices were taken out after two days. We opted for surgical intervention when patients had no clinical or laboratory improvement after antibiotic therapy for three days. Three different examination methods were used. These methods can be specified as salpingo-oophorectomy, abscess drainage with USG guidance, and finally total hysterectomy with salpingo-oophorectomy.

Data on sociodemographic characteristics, clinical results, presence of an IUD, previous pelvic surgery, pelvic radiological findings, laboratory results, surgical types, and complications were collected. The experiment is conducted with two different groups, one group had medical treatment only and the other group had both surgery and the medical treatment and these two groups are compared.

### **Statistical analysis**

SPSS 20.0 for Windows (SPSS, Chicago, IL) can be shown among the programs used for statistical analysis. In addition to the number of cases, percentages were also determined as qualitative variables. Kolmogorov-Smirnov test was used to confirm that the data were normally distributed. The Fisher's exact test and Pearson's chi-square tests were used to differentiate abnormal values, while Student's t-test was utilized to compare data using the mean and standard deviation values. Also, nonnormal data were expressed in terms of the median value using Mann-Whitney U-test. Values determined by applying the (ROC) curve are a receiver operating characteristic with specificity, sensitivity, and cut-off values. These are determined with the aim of forming a prediction about the surgical intervention applied in the treatment of TOA. The reason for setting  $P < 0.05$  is to provide statistical significance.

## RESULTS

In total 140 cases of TOA are examined. A total of four patients were excluded due to missing data, and data of 136 patients were analyzed. Ninety-eight of the cases received both medication and surgery (72.05%) and 38 of the cases received only medication (27.95%).

In this study age of the patients did not create statistically meaningful difference between the group had medical treatment only and the other group had both surgery and the medical treatment. In addition, the hospital staying duration was reduced within the group who had only medical treatment (Tab. 1). According to our statistical analysis, when patients apply for the main reason for abdominal pain, it may be a treatment failure with a medical procedure. We also found that when the abscess size is more significant than 5.5 cm, it's a more beneficial treatment to undergo surgical intervention.

**Table 1.** Comparison of group had medical treatment only and the group had both surgery and the medical treatment

<b>Variables</b>	<b>Surgical + medical treatment (n = 98) (72.05%)</b>	<b>Only medical treatment (n = 38) (27.95%)</b>	<b>p</b>
Age (y)	39.11 ( $\pm$ 11.70)	41.47 ( $\pm$ 9.52)	0.274
Gravidity	2.80 ( $\pm$ 1.67)	3.00 (2.31)	0.589
Parity	2.07 ( $\pm$ 1.25)	2.13 ( $\pm$ 1.66)	0.820
Abort/Curettage	0.63 ( $\pm$ 0.95)	0.81 ( $\pm$ 1.44)	0.391
IUD Existence	27 (27.55%)	11 (28.94%)	0.872
Diabetes mellitus	6 (6.12%)	1 (2.63%)	0.120
Main reason of apply			
Abdominal pain	75 (76.53%)	35 (92.2%)	< 0.05*
Vaginal bleeding	4 (4.08%)	1 (2.63%)	0.751
Postoperative	12 (12.24%)	1 (2.63%)	0.113

Vaginal discharge	7 (7.15%)	1 (2.63%)	0.368
Length of hospitalization (Days)	7.82 ( $\pm$ 4.2)	5.81 ( $\pm$ 4.1)	< 0.05*
Diameter of abscess $\geq$ 5.5 cm	74 (75.51%)	17 (44.73%)	< 0.05*

\*Statistically significant

The type of surgeries and complications are given in Table 2. Of the 98 patients requiring surgery, 54 (55.11%) received drainage of abscess, 37 (68.51%) underwent laparotomy, 9 (16.61%) underwent laparoscopy, and 8 (14.82%) received) patients underwent USG-guided drainage ( $p < 0.05$ ). No complications were observed in patients who underwent USG-guided drainage ( $p < 0.05$ ). Moreover, the surgery type (laparotomy and laparoscopy) did not create a significant difference in terms of complications ( $p > 0.05$ ).

**Table 2.** Comparison of surgery types and complications of the patients underwent surgery

	<b>Laparotomy (n = 71) (72.45%)</b>	<b>Laparoscop y (n = 19) (19.38%)</b>	<b>USG-guided drainage (8) (8.17%)</b>	<b>p</b>
Drainage (%)	37 (52.12%)	9 (47.36%)	8 (100%)	< 0.05*
Unilateral salpingo-	18 (25.35%)	6 (31.57%)		0.591

oophorectomy (%)			
Bilateral salpingo- oophorectomy (%)	9 (12.67%)	3 (15.78%)	0.727
Hysterectomy + bilateral salpingo- oophorectomy (%)	7 (9.86%)	1 (5.29%)	0.537
Bowel injury	19 (26.76%)	3 (15.78%)	0.328
Blood transfusion	8 (11.28%)	3 (15.78%)	0.598
Bladder injury	2 (2.82%)	2 (10.52%)	0.151
Ureteral injury	2 (2.82%)	1 (5.26%)	0.603
Wound infection	2 (2.82%)	1 (5.26%)	0.603
Vascular injury	1 (1.41%)	1 (5.26%)	0.317

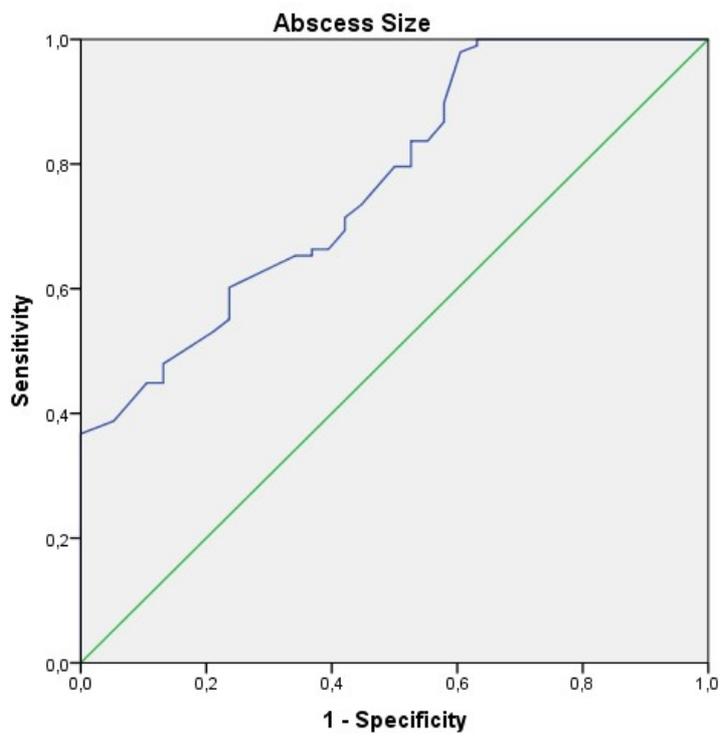
\*Statistically significant

Table 3 provides the cutoff values for abscess size to forecast surgical therapy. Figure 1 depicts the calculated ROC curve area under the abscess size curves. A cut-off value of 5.5 cm, the ROC analysis's AUC (= 0.770) for size was statistically significant. (95% CI 0.686–0.855, sensitivity 71.5%, specificity 61.3%).

**Table 3.** Cutoff values of abscess size

	<b>Cute-off size</b>	<b>AUC</b>	<b>95% CI</b>	<b>Sensitivity (%)</b>	<b>Specificity (%)</b>	<b>p</b>
<b>Abscess size</b>	5.5 cm	0.770	0.686–0.855	71.5	61.3	< 0.05*

AUC — area under the curve; CI — confidence interval; \*statistically significant



**Figure 1.** Characteristic curve relative to abscess diameter to predict a possible surgery

## **DISCUSSION**

Women in the reproductive age range are more likely to develop TOAS, which are inflammatory processes that cause masses in the pelvic organs and are characterized by fever, pelvic and/or stomach discomfort, and vaginal discharge. In case of possible TOA, physicians should perform a pelvic exam with supplementary laboratory tests and pelvic radiological imaging for a more accurate diagnosis. Since TOAS can affect a patient's fertility and, more importantly, possess a fatal risk in some conditions, it is crucial that early diagnosis and treatment should be done [8–10].

In our study, we investigated the value of surgical and medical treatment for TOA. We found that only medical treatment group patients benefited from more rapid recovery. We also found that there is an association between the diameter of abscess higher than 5.5 cm and antibiotic treatment failure for pelvic abscesses. On the other hand, our study has shown us that if their main complaint for applying for medical help is abdominal pain, surgery is more beneficial compared to medical care. Age, gravidity, parity, abort/curettage, IUD presence, and diabetes mellitus did not significantly affect the risk of surgical therapy.

In the literature, there are contradicting results about potential risks of TOA treatment. Some studies have shown that previous pregnancies, age and existence of IUD were classified as potential risk factors. On the contrary, in other studies, no relation was found with these risk factors [8, 9, 11, 12]. In our study, 27.55% of patients with TOA used IVD. Despite some studies suggesting that using an IUD more than doubles the incidence of PID [13], using an IUD was not linked to a higher chance of undergoing surgical therapy [8]. Inal et al. discovered that the size of the abscess, the presence of a complicated multi-cystic mass, C-reactive protein count, erythrocyte sedimentation rate predicts the need for a surgical treatment [15].

In our clinic, regardless of patients' medical status, laparotomy surgical interventions are the first choice for surgical treatment. We performed USG-guided drainage on only eight patients and had no statistically significant complications with these interventions. There was also no difference between laparotomy and laparoscopic surgery groups regarding complications.

The literature revealed a link between the diameter of the abscess and the effectiveness of medical therapy, which led to a rise in surgery and complications [8, 9, 14]. There were different cutoff values found for abscess size in the literature differs, from 6.5 cm to 8 cm [15, 16]. With a sensitivity of 71.5 percent and a specificity of 61.3 percent, our study found that an abscess size greater than 5.5 cm is a criterion for surgical intervention.

Although there is no definitive antibiotic treatment for this condition, broad field antibiotics seem to be the first choice in treatment. For some patients, only medical treatment with antibiotics can be helpful for improvement [4, 8]. In our study, 27.95% of the patients recovered with only medical treatment.

The major strength of our research is that we evaluated all parameters in a single examination. However, its retrospective methodology and having all the patients from a specific hospital with a small sample size are the main limitations of our study.

## **CONCLUSIONS**

Early prediction of determining which TOA patients will require surgery is very important due to the potential risk of morbidity and mortality. We found that abscess size (5.5 cm) can be helpful in performing surgical procedures. We also suggest that less invasive USG-guided drainage procedures can be the first choice in surgical management with fewer complications.

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### ***Availability of data and materials***

The dataset supporting the present study results is included in the article.

### ***Ethics approval and consent to participate***

The clinical ethics committee approved this study of Kanuni Sultan Suleyman Training and Research Hospital (Istanbul, Turkey), and individual informed consent was waived for retrospective analysis.

### ***Competing interests***

All authors declare that they have no competing interests.

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