



## The Clinical Management Of 59 Tubo-Ovarian Abscess Cases

## 59 Tubaovaryan Abse Olgusunun Klinik Yönetimi

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## Abstract

<b>Aim</b>	This study aims to retrospectively evaluate the incidence, risk factors, clinical and laboratory outcomes, complications and management strategies of the tubo-ovarian abscess (TOA).
<b>Material and Method</b>	The records of 59 patients who had been hospitalised with the diagnosis of tubo-ovarian abscess between January 2016 and January 2021 were studied retrospectively. The patients' clinical and laboratory results, operational methods applied, and the complications raised were recorded. Demographic data and sonographic findings of the patients were reported.
<b>Results</b>	The mean age of the patients was 36.53 ± 9.26 years. The most common complaints were pelvic pain (100%), vaginal discharge (42.4%), fever (35.6%) and menstrual irregularity (30.5%). The mean abscess size was 6.31 ± 2.08 [3-12] cm. The patients were divided into two groups as those who underwent surgery and received only medical treatment. While only medical treatment was sufficient in 28 (47.5) patients, surgical treatment was applied to 31 (52.5%) patients. There was no statistical difference in terms of gravida, parity, BMI, duration of the marriage, PIH (pelvic inflammatory disease) history, previous operation history and additional systemic disease. The presence of an intrauterine device (IUD), duration of IUD use, and TOA size were significantly higher in the surgical group. Abscess sizes in patients who used only medical treatment were statistically significantly lower than in those who required surgery (4.22 × 1.94 cm, 8.15 × 2.28 cm; p<0.001). The hospital stay was also shorter in the medical treatment group (p: 0.629). The most common surgical complications were bladder damage (12.9%), bowel perforation (9.6%), and ureteral damage (9.6%), respectively. The pathology report of only one patient was detected as malignant (3.2%).
<b>Conclusion</b>	Early diagnosis and treatment of TOA are essential as it has severe life-threatening consequences such as morbidity and mortality. The appropriate treatment method should be selected according to the operator's experience, the patient's age, fertility desire, abscess size and spread, the patient's risk factors, and clinical and laboratory results.
<b>Keywords</b>	Medical Treatment, Surgical Treatment, Tubo-ovarian abscess, Pelvic Inflammatory Disease

## Özet

<b>Amaç</b>	Retrospektif olarak, tubo-ovaryan abse (TOA) olgularının insidansını, risk faktörlerini, klinik ve laboratuvar sonuçlarını, komplikasyonlarını ve yönetim stratejilerini değerlendirmek.
<b>Gereç ve Yöntem</b>	Ocak 2016- Ocak 2021 yılları arasında, klinik ve sonografik olarak TOA tanısı ile kliniğimize yatışı yapılan 59 hastanın dosyası retrospektif olarak incelendi. Hastaların demografik verileri ve sonografik bulguları raporlandı. Hastaların klinik ve laboratuvar sonuçları, uygulanan operasyon yöntemleri ve gelişen komplikasyonlar kaydedildi.
<b>Bulgular</b>	Hastaların ortalama yaşı 36.53 ± 9.26 idi. En sık pelvik ağrı (100%), vajinal akıntı (42.4%), ateş yüksekliği (35.6%) ve adet düzensizliği (30.5%) şikayetiyle başvuruldu. Ortalama abse boyutu 6.81 ± 2.08 [3-12] cm idi. Hastalar operasyon olanlar ve olmayanlar olarak iki gruba ayrıldı. Yirmi sekiz (47.5%) hastada sadece medikal tedavi yeterli olurken, 31 (52.5%) hastaya cerrahi tedavi uygulandı. Hastaların gravide, parite, BMI, evlilik süresi, PIH (pelvik inflamuar hastalık) öyküsü, geçirilmiş operasyon öyküsü ve ek sistemik hastalık açısından istatistiksel fark görülmedi. Rahim içi araç (RİA) varlığı ve kullanım süresi, TOA boyutu cerrahi yapılan grupta anlamlı olarak daha fazla bulundu. Sadece medikal tedavi uygulanan hastaların abse boyutları, operasyon gereken hastalara göre istatistiksel anlamlı olarak daha düşük saptandı (4.22 ± 1.94cm, 8.15 ± 2.28cm; p<0.001). Hastanede kalma süresi de medikal tedavi edilen grupta daha kısa idi (p:0.629). En sık cerrahi komplikasyon sırasıyla; mesane hasarı (12.9%), barsak perforasyonu (9.6%) ve üreter hasarı (9.6%) olarak gözlemlendi. Sadece bir hastanın patoloji sonucu malign olarak tespit edildi (3.2%).
<b>Sonuç</b>	TOA'nın erken tanı ve tedavisi, morbidite ve mortalite gibi hayatı tehdit eden ciddi sonuçları olmasından dolayı önemlidir. Operatör deneyimi, hastanın yaşı, fertilité arzusu, abse boyutu ve yayılımı, hastanın risk faktörleri, klinik ve laboratuvar sonuçlarına göre uygun tedavi yöntemi seçilmelidir.
<b>Anahtar Kelimeler</b>	Cerrahi tedavi, Medikal tedavi, Pelvik inflamatuvar hastalık, Tubo-ovaryan abse.

## INTRODUCTION

Pelvic inflammatory disease (PID) is an inflammatory disease of the upper female genital tract covering different spectrums such as endometritis, salpingitis, oophoritis and pelvic peritonitis<sup>1</sup>. A tubo-ovarian abscess (TOA) usually occurs as a complication after acute and chronic PIH<sup>2</sup>. TOA is reported to occur in 33% of hospitalised patients with acute PID<sup>3</sup>. It often occurs because of recurrent infections of the adnexal organs. As a result of the progression of the infection, involvement of the intestines, uterus, omentum, and bladder may occur<sup>4</sup>.

The clinical presentation of TOA varies. It usually presents with symptoms such as pelvic pain (90%), vaginal discharge, irregular bleeding, nausea, and vomiting. Fever higher than 37.8 °C is present in 60-80% of cases, and leucocytosis is present in 60%.<sup>5</sup> Detection of pelvic mass by gynaecological examination and radiological interventions supports the diagnosis<sup>6</sup>. Ultrasonography (USG), Computed Tomography (CT) and Magnetic Resonance (MR) are imaging modalities used to monitor the response of patients to treatment and monitor complications<sup>7</sup>. First-line therapy in unruptured cases is broad-spectrum antibiotics. In unsuccessful antibiotic therapy, the required surgical treatment is either laparoscopy, laparotomy, or imaging-guided drainage<sup>8,9</sup>. It is crucial to determine the risk factors of TOA, which has high complication, morbidity, and mortality rates. In this respect, patients' early diagnosis and treatment strategies should be determined, and more effective preventive methods should be developed.

This study aims to evaluate the incidence, demographic characteristics, risk factors, complications, and management strategies of patients hospitalised with TOA diagnosis in our clinic in the last five years and thus contribute to the literature.

## METHOD

The records of a total of 59 patients aged between 15-and 50 years who were hospitalised with the diagnosis of TOA

in the gynaecology and obstetrics clinic of the Health Sciences University (SBU) Bursa Yüksek İhtisas Training and Research Hospital between January 2016 and January 2021 were analysed retrospectively. Only 1 patient was excluded from the study due to insufficient recorded information. This study was approved by the ethics committee of SBU Bursa Yüksek İhtisas Training and Research Hospital.

Demographic characteristics of the patients, complaints at the time of admission, risk factors, recent operation or intrauterine surgical intervention history were investigated. Clinical and physical examination findings, laboratory values, USG and/or CT results were determined. TOA was diagnosed according to clinical and laboratory findings and results of USG and CT images or during operations performed with indications such as the acute abdomen and pelvic mass. Clinical findings and laboratory values were taken as  $\geq 38$  °C for fever,  $>9,000$  / $\mu$ L for blood leukocyte count, and  $>1.5$  mg/dL for CRP at the first admission. TOA was defined as a dense, complex cystic mass on USG and a complex mass with regular or irregular thick margins and an air-fluid level on CT. The diameter and characteristics of the mass were examined by imaging methods.

Triple antibiotic therapy [ceftriaxone (2x1g/day) + clindamycin (3x600mg/day) + gentamicin (2x80mg/day)] was started as primary treatment for the cases. Surgical approach was considered in cases that did not respond to antibiotic therapy within 24-48 hours. Considering the patient's age, fertility request, and the extent of the abscess, surgery was planned based on the severity of the case.

Data were evaluated in SPSS (Statistical Package for Social Sciences) for Windows 12, Epi Info, and Microsoft Office Excel programs for statistical analysis. Since the data did not have a normal distribution, descriptive statistics, chi-square frequency distributions and Mann Whitney U test were used. Variables were expressed as mean and standard deviation. The results were considered statistically signifi-

cant if they were within the 95% confidence interval and  $p < 0.05$ .

### Findings

The mean age of 59 tubo-ovarian abscess cases included in the study was calculated as  $36.53 \pm 9.26$  years. Gravida's number was 2 [0-7]. Considering the risk factors, 29 (49.2) of the cases had intrauterine device (IUD) use. The most common symptom was pelvic pain with 59 (100%). Ultrasound examination was performed in all of the cases, and the most common imaging method after the ultrasound was computed tomography with 38 (64.4%). The number of abscesses was  $1.25 \pm 0.44$ , and the size of the abscess was  $6.81 \pm 2.08$  cm. Surgical treatment was performed in 31 (52.5%) of the cases, and the most common surgery was unilateral salpingo-oophorectomy (18 (58.1%). During surgery, the most common complication was bladder damage with 4 (12.9%). Demographic information and clinical and laboratory parameters of the cases are given in Table 1.

When the patients who underwent surgical treatment and those who received medical treatment were compared, the parameters of age, gravida, parity, BMI, abscess size, WBC, CRP, duration of antibiotic use and length of hospital stay were found to be similar in both groups ( $p > 0.05$ ). The rate of IUD use (18 (%58) vs 11 (%39.2),  $p = 0.013$ ), and duration of IUD use (4 [0-9] vs 1 [0-6],  $p = 0.002$ ) were found to be higher in the surgical group than in the medical treatment group. The size of the abscess ( $8.15 \pm 2.28$  vs  $4.22 \pm 1.94$ ,  $p < 0.001$ ) was found to be larger in the surgical group than in the medical treatment group. Surgical treatment was applied to 31 patients out of 59, and medical treatment was applied to 28 patients. The comparison of the demographic and clinical data of the medical treatment group and the surgical treatment group according to the operation status is given in Table 2.

**Table 1.** Demographic information, clinical and laboratory parameters of the cases

	Mean±SD Median (min-max) n(%)
Age (years)	36.53 ± 9.26
	39 [21-65]
Gravida	2.17 ± 1.53
	2 [0-7]
Parity	1.88 ± 1.47
	2 [0-7]
BMI (kg/m <sup>2</sup> )	0.81 ± 3.92
	31.2 [17.3-39.5]
Duration of marriage	6.07 ± 4.90
	[1-10]
<b>Risk factors</b>	29 (49.2)
IUD use n (%)	2.98 ± 3.41
Duration of IUD use	0 [0-12]
PID history n (%)	29 (49.2)
Operation history n (%)	26 (44.1)
Additional Systematic disease n (%)	22 (37.3)
<b>Symptoms n(%)</b>	
Fever	21 (35.6)
Pelvic Pain	59 (100)
Irregular menstruation	18 (30.5)
Vaginal discharge	25 (42.4)
<b>Scan n(%)</b>	
USG	59 (100)
BT	38 (64.4)
MR	23(38,9)
<b>Laboratory findings</b>	
WBC (µL)	15.30 ± 7.98
CRP (mg/dL)	72.0 [18.4-297.0]
Number of abscesses	1.25 ± 0.44 1.0 [1-2]
Abscess size (cm)	6.81 ± 2.08 6.0 [3-12]
<b>Operation Type n(%)</b>	
Medical	28 (47.5)
Surgical	31 (52.5)
<b>Applied operation n(%)</b>	
TAH+BSO	11 (35.4)
USO	18 (58.1)
Percutaneous drainage	2 (6.5)
<b>Complications n(%)</b>	
Bowel perforation	3 (9.6)
Bladder damage	4 (12.9)
Ureteral damage	3 (9.6)
Peritonitis	1 (3,2)

**Table 2.** Comparison of demographic and clinical data according to the operation status

	Surgical Treatment (n=31)	Medical treatment (n=28)	P
Age (years)	37.31 ± 8.58	34.64 ± 9.89	0.065
Gravida	2 [0-6]	2 [0-7]	0.754
Parity	2 [0-7]	2 [0-7]	0.888
BMI (kg/m2)	31.32 ± 3.27	30.40 ± 4.37	0.377
<b>Risk factors</b>			<b>0.013</b>
IUD use n (%)	18 (58)	11 (39.2)	<b>0.002</b>
Duration of IUD use	4 [0-9]	1 [0-6]	0.193
PID history n (%)	15 (48.3)	14 (50)	0.412
Operation history n (%)	14 (45.1)	12 (42.8)	0.184
Additional Systematic disease n (%)	12 (38.7)	10 (35.8)	
Number of abscesses	1.23 ± 0.43	1.27 ± 0.45	0.719
Abcess size (cm)	8.15 ± 2.28	4.22 ± 1.94	< <b>0.001</b>
<b>Laboratory findings</b>			
Wbc (μL)	15.30 ± 7.98	13.69 ± 4.96	0.347
CRP (mg/dL)	72.0(18.4-297.0)	70.0(6.7-279.0)	0.300
Antibiotic use period	10 [2-23]	7 [2-20]	0.825
Length of stay in hospital	10,11 ± 1,9 [2-23]	8,02 ± 1,1 [2-22]	0.629

## DISCUSSION

This study aimed to determine the management of TOA cases and the risk factors in operated patients retrospectively. TOA is an inflammatory, infectious disease of the tuba uterine, ovaries and surrounding adnexal tissues<sup>10</sup>. It is thought that infectious agents come ascending from the lower genital tract and occur after PID. The incidence of TOA increases in parallel with the increase in sexually transmitted diseases<sup>11</sup>. It is commonly seen in the reproductive age. It is observed to a lesser extent in the menopausal period<sup>12</sup>. In this study, all patients were women of reproductive age with regular menses, with a mean age range of 36.53 ± 9.26 years.

Generally, TOA is manifested by an adnexal mass, fever, abdominopelvic pain and/or vaginal discharge, high leukocyte count and/or elevated CRP (C reactive protein); however, the picture of this disease can be quite variable. In untreated conditions, abscess rupture and subsequent life-threatening sepsis and mortality can occur, so any

clinical concern for this diagnosis requires rapid evaluation and treatment<sup>13</sup>. In our study, patients were admitted with the most frequent complaints of pelvic pain (100%), vaginal discharge (42.4%) and fever (35.6%), respectively. When the complaints of patients with TOA were examined in similar studies, abdominopelvic pain (90%) was the most common, followed by fever (50%), vaginal discharge (28%), and abnormal uterine bleeding (21%) (5,13). When we analysed the laboratory results of our patients, leucocytosis (mean 12.700/μL) and CRP elevation were detected in all patients. While CRP was above 5.5 in 88% of the patients, CRP was below 5.5 in 12%. Medical treatment [(ceftriaxone(2x1g/day) + clindamycin (3x600mg/day) + gentamicin(2x80mg/day)] was sufficient in patients with CRP below 5.5. Similarly, Reljic et al. found a 94% increase in CRP in TOA patients<sup>14</sup>. Studies on this subject have emphasised that high serum CRP is due to the prevalence of tissue damage and that high concentration reflects the severity of the clinic<sup>14,15</sup>.

TOA is reported to occur in 33% of hospitalised patients with acute PID<sup>3</sup>. The most common risk factors associated with PID are young age, age at first intercourse, multiple sexual partners, socioeconomic status, low education level, presence of bacterial vaginosis and sexually transmitted diseases. It is also known that the use of an intrauterine device (IUD) is a significant risk factor in the development of PID<sup>11,16</sup>. In this study, the presence of IUD was detected in 49.3% of the patients, and the IUD was withdrawn after 48 hours of antibiotic pressure. In the study of Turan et al., the presence of IUD was observed in 41% of cases<sup>17</sup>. Karakulak et al. reported this rate as 48.7% (18). Similar to other studies, in our study, the presence of IUD was relatively high in patients with TOA, with a mean duration of use of 2.98 3.41(0-12) years. In addition, the presence and duration of IUD use were found to be statistically significantly higher in patients requiring surgery in our study.

Although the traditional approach in TOA is surgical drainage, with the introduction of new generation antibiotics with broad-spectrum and penetrating the abscess wall, there may be cases where only medical treatment is sufficient. In this study, the mean abscess size was 6.31 cm. De-witt et al. correlated abscess size with treatment success and reported 43% treatment failure in abscesses >8 cm<sup>19</sup>. Reed et al., on the other hand, predicted that there is an inversely proportional relationship between the success of medical treatment and TOA size and that TOAs larger than 10 cm have a more than 60% probability of requiring surgery<sup>20</sup>. Only medical treatment (triple antibiotic therapy) was sufficient in 47.5% of the patients in our study. The abscess size of these patients was (4.22cm), and it was found to be statistically significantly lower than the patients who required surgery (8.15cm) ( $p < 0.001$ ). In addition, the duration of hospitalisation and antibiotic use of these patients was shorter. This is an essential advantage in terms of patient cost. Improvement of clinical symptoms, decrease in fever, decrease in leucocytosis and CRP, and decrease in abscess mass were accepted as indicators of response to medical treatment. When there was no response

to the treatment within 48-72 hours, we performed laparoscopy, laparotomy, USG or CT guided abscess drainage in addition to medical treatment. In the literature, there are also studies suggesting direct interventional drainage with medical treatment at the beginning and advocating that treatment success is high<sup>21,22</sup>. According to current data, laparoscopy is accepted as the gold standard surgical method, especially in cases with suspected abscess rupture<sup>23</sup>. However, laparotomy is preferred as the primary approach in TOA treatment by most gynaecologists. In our study, laparoscopy was preferred as the surgical method in cases where it was thought that there was no response to medical treatment (56%). In addition, TAH+BSO applied cases were less frequent (25.4%). This may be due to the fact that the mean age in the patient group included in the study was compatible with the reproductive period. In addition, 2 cases (6.5%) were hospitalised with the diagnosis of abscess rupture and surgical laparotomy was performed under emergency conditions. Abscess rupture has been described in the literature at a rate of 15% in TOA cases<sup>24</sup>. We applied wig drainage under antibiotic pressure for 48-72 hours in two patients who had previously been operated on for TOA and developed recurrence. All patients who were given triple antibiotic therapy during the postoperative period were discharged after an average of 7 days. The most common surgical complications were bladder injury (12.9%), bowel perforation (9.6%) and ureteral injury (9.6%), respectively. Our results were higher than the literature<sup>24,25</sup>. We attributed this to the fact that our patients had high adhesions due to the high rate of previous operation history (45.1%).

## CONCLUSION

When our study is evaluated in the light of the literature, early diagnosis and treatment of TOA are essential because it has serious life-threatening consequences such as morbidity and mortality. The surgical approach may vary depending on the operator's experience, the patient's age, desire for fertility, and the extent of the abscess. In addition, we believe that among the risk factors, especially the

presence of IUD, duration of IUD use, and abscess size increase the need for surgery.

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#### **Conflict of interest**

The authors have no conflict of interest.

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