

Tubo-Ovarian Abscess: The Treatment by Interventional Radiology and Laparoscopy Related to Abscess Size

Tubo-Ovaryan Apse Boyutuna Göre Girişimsel Radyoloji ve Laparoskopik Tedavisi

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ABSTRACT Objective: To determine the feasibility of the treatment of tubo-ovarian abscess by interventional radiology and laparoscopy related to abscess size. **Material and Methods:** We collected data from 43 patients admitted with the diagnosis of tubo-ovarian abscess from January 1, 2008 to January 1, 2011. Three abscess groups were created according to size as Group I: ≤ 4 cm (n=12), Group II 5-8 cm (n=23) and Group III: >8 cm (n=8). Symptoms and signs on admission, findings of laboratory testing and diagnosing imaging, treatment modalities and the duration of the hospitalization were recorded. The feasibility of the interventional radiology and the laparoscopy and conversion to laparotomy in the treatment groups were analysed. **Results:** Four of the patients were treated only by antibiotics and anti-inflammatory agents. Two of the patients in group I, five of the patients in group II and four of the patients in group III were managed by transvaginal or transabdominal catheter drainage under the guidance of ultrasonography or tomography respectively. Four of the patients in group I and seven of the patients in group II were treated with laparoscopy. Laparoscopy was failed in 6 out of 17 patients whom were converted to laparotomy. The only reported complication was a bowel injury in one of the cases at laparotomy. **Conclusion:** Treatment of tubo-ovarian abscess by drainage under the guidance of interventional radiology should be encouraged. Laparoscopy may be a surgical management option in experienced clinics in patients with abscess size <8 cm.

Key Words: Abdominal abscess; laparoscopy; radiography, interventional; surgical procedures, minimally invasive

ÖZET Amaç: Abse boyutuna göre girişimsel radyoloji ve laparoskopik tedavi uygulanabilme başarısının değerlendirilmesi. **Gereç ve Yöntemler:** 1 Ocak 2008-1 Ocak 2011 tarihleri arasında tubo-ovaryan apse tanısı ile tedavi edilen 43 hastaya ait kayıtlar incelendi. Abse boyutuna göre üç grup oluşturuldu. Grup I: ≤ 4 cm (n=12), Grup II 5-8 cm (n=23) ve Grup III: >8 cm (n=8). Semptomlar ve laboratuvar bulguları, radyodiagnostik görüntüleme bulguları, tedavi yöntemleri ve hastanede kalış süreleri kaydedildi. Girişimsel radyoloji ve laparoskopik tedavilerin etkinliği ve laparotomiye dönen olgular gruplar arasında değerlendirildi. **Bulgular:** Hastalardan dördü sadece antibiyoterapi ve anti-inflamatuarlar ile tedavi edildi. Grup I'de iki, grup II'de beş ve grup III'te dört hasta ultrasonografi veya tomografi eşliğinde transabdominal veya transvajinal kateter drenajı ile tedavi edildi. Grup I'de dört ve grup II'de yedi hasta laparoskopik olarak opere edildi. 17 hastadan 6'sında laparoskopi batın içi yaygın yapışıklıklar nedeniyle başarısız oldu ve laparotomiye dönüldü. Laparotomi esnasında bir olguda barsak yaralanması tek komplikasyon olarak bildirildi. **Sonuç:** Tubo-ovaryan apselerin girişimsel radyoloji kılavuzluğu altında drenajı cesaretlendirilmelidir. Deneyimli kliniklerde ve apse boyutu <8 cm olgularda cerrahi tedavide laparoskopik yaklaşım tercih edilebilir.

Anahtar Kelimeler: Abdominal apse; laparoskopi; radyografi, girişimsel; cerrahi işlemler, minimal girişimsel

Tubo-ovarian abscess (TOA), typically the end result of acute pelvic inflammatory disease (PID), is a condition characterized by a walled-off inflammatory mass in the pelvis of the abdominal cavity.^{1,3} Although the abscess involving the ovary and fallopian tube most often arises as a consequence of PID; however, TOA can also develop following pelvic surgery, or as a complication of an intraabdominal process, such as appendicitis or diverticulitis or infertility treatment including transvaginal oocyte retrieval.^{4,5} Despite the dramatic decrease of mortality associated with TOA; it remains a significant morbidity with its complications including infertility, ectopic pregnancy, chronic pelvic pain, pelvic thrombophlebitis and ovarian vein thrombosis.^{3,9}

Currently, the literature on TOA focuses upon the success of minimally invasive ultrasonography-guided or computer tomography (CT)-guided drainage accompanied by medical therapy.¹⁰⁻¹⁸ Additional studies have suggested that imaging-guided drainage may be as effective as a salvage technique in patients who are nonresponsive to treatment with primary antibiotics, and also those patients undergoing primary drainage may have shorter hospital stays and faster resolutions.¹³ The aim of our study is to determine the clinical results of the early treatment of tubo-ovarian abscess by interventional radiology and laparoscopy related to abscess size.

MATERIAL AND METHODS

Medical records of 43 women hospitalized with the diagnosis of tubo-ovarian abscess at Bakirkoy Dr.Sadi Konuk Training and Research Hospital gynecology clinic from January 1, 2008 to January 1, 2011 were reviewed retrospectively. Informed consent was obtained from all of the patients before the diagnostic and treatment modalities. Clinical characteristics of the patients, findings laboratory testing and diagnostic imaging, the treatment modalities and the duration of the hospitalization were recorded. All the patients were having an inflammatory mass in the pelvis. Data were collected for clinical presentation, symptoms and signs (ab-

dominal pain, abnormal uterine bleeding, vaginal discharge, rebound, guarding, fever) white blood cell count, treatment modalities and clinical courses. The diagnostic imaging were done by one or more of the methods including ultrasonography, magnetic resonance imaging (MRI) or CT. Antibiotherapy was started at the beginning of the hospitalization including ampicillin 2 g IV every 12 hours, clindamycin 900 mg IV every 8 hours and, gentamicin 80 mg every 8 hours. All of the patients were examined by a interventional radiologist for the drainage of the abscess. Transvaginal or abdominal route of the drainage was selected according to easiest accessibility. CT was used for the safe access of the abscess in complicated cases. Early laparoscopic surgery was offered as a treatment choice in patients for whom drainage had failed or not appropriate because of the localization. Laparoscopy was performed by the experienced surgeons. Laparoscopic treatment were converted to laparotomy in cases whom the laparoscopic treatment were not applicable. Fever was defined as temperature greater than 38.2°C. Complications were defined as factors that could result in prolonged hospitalization; intensive care admission, bowel or urinary bladder injury, blood transfusion, blood loss >1000 ml, ileus, sepsis or death.

Three groups were created according to size of abscess. Group I: ≤ 4 cm (n=12), Group II 5-8 cm (n=23) and Group III: >8 cm (n=8). If bilateral abscess were identified, the larger of the two were selected to quantify the size of the abscess. The duration of the hospitalization, the treatment method and the complications were recorded in all of the patients. SPSS 16 software was used for the statistical analysis. Descriptive statistics were calculated using mean, standart deviation and percentages.

RESULTS

The age of the patients were between 17-64 years. The mean age of the patients was 37.9 ± 9.5 SD years, and the mean gravidity and the parity were 3.37 and 2.39 respectively. The most common reason for the admission was abdominal pain (100%) with a median duration of 3 days. Only 13 (30.2%)

TABLE 1: Clinical characteristics of the patients.

	Positive N	%
Pain	43	100
Abnormal bleeding	8	18.6
Abnormal vaginal discharge	16	37.2
Fever	13	30.2
Rebound	10	23.2
Guarding	26	60.4
Adnexal tenderness	23	53.4
Cervical motion tenderness	32	74.4

of the patients had fever on admission. Abdominal pain and fever were the most significant findings. The clinical characteristics of the patients were presented in Table 1.

The mean white blood count (WBC) on admission was $13\,320/\text{mm}^3$. The WBC was less than $10\,000/\text{mm}^3$ in 18.6 % of the cases. Ultrasonography was used for the diagnosis in all of the patients. CT was carried out 28 of the patients whom were consulted by the interventional radiology. Abscess size ranged from 3 cm to 12 cm with mean of 6.4 cm. Twenty-three (23%) of the patients had an abscess size 5-8 cm. Laboratory and diagnostic imaging characteristics of the patients were presented in Table 2.

The mean duration of hospitalization was 7.9 ± 3.9 days. Four of the patients were treated by only antibiotics and anti-inflammatory agents and all of them were in group I. The mean duration of hospitalization in patients with medical treatment

was 9.5 days(7-13 days). Two of the patients in group I, five of the patients in group II and four of the patients in group III were managed by transvaginal or transabdominal catheter drainage under the guidance of ultrasonography or tomography respectively. Four of the patients in group I and seven of the patients in group II were treated with laparoscopy. Laparoscopy was failed in 6 out of 17 patients in whom the operation were converted to laparotomy (Table 3). The only reported complication was a case of bowel injury at laparotomy.

DISCUSSION

In this study we have found that TOA size is associ-

TABLE 2: Laboratory and diagnostic imaging characteristics of the patients

	Positive N	%
Ultrasonography performed	100	100
CT performed	28	65.1
WBC		
<10 000	8	18.6
10 000 to 15 000	21	48.8
>15 000	14	32.6
Abscess location		
Right	17	39.6
Left	19	44.1
Bilateral	7	16.3
Abscess size		
0-4 cm	12	28.0
5-8 cm	23	53.4
>8 cm	8	18.6

TABLE 3: Treatment modalities, success rates and hospitalization periods in relation with abscess size.

	GroupI: ≤ 4 cm (n=12)	GroupII: 5-8 cm (n=23)	GroupIII: >8 cm (n=8)	Total
Medical treatment	4	0	0	4
Drainage	4	7	4	15
Successful	2 (50%)	5 (71.4%)	4 (100%)	11
Failed	2 (50%)	2 (28.6%)	0 (0%)	4
Laparoscopy	6	11		17
Successful	4 (66.6%)	7 (63.6%)	-	11
Failed	2 (33.4%)	4 (36.4%)	-	6
Laparotomy	2	11	4	17
Duration of hospitalization (days)	6.9 ± 3.6	8.2 ± 3.9	9.2 ± 3.9	7.9 ± 3.9

ated with longer duration of hospitalization as well as an increased need for surgery or drainage when compared with those patients with abscess size smaller than 5 cm. Parallel to our findings, Dewitt et al. in a retrospective study including 135 TOA; found that TOA size is associated with important outcomes including more complications and longer duration of hospitalization as well as an increased need for surgery or drainage when compared with those patients with smaller abscess.¹⁹ Reed et al. also found that increasing abscess size is associated with increasing need for operative management.²⁰

Although medical management with broad spectrum antibiotics is now generally considered as the initial management of unruptured TOA; however, optimal treatment of TOA remains unclear.²¹ The 2006 center for disease control and prevention sexually transmitted diseases treatment guidelines recommends inpatient intravenous antibiotics for at least 24 hours. These guidelines also recommends considering surgery or drainage when the patient displays a failure to respond in 48 to 72 hours.⁹ In the for mentioned studies by Dewitt et al. and Reed et al. failure rate for abscess >8-10 cm were 43-60% respectively.^{19,20} This high failure rates can let the clinicians to requirement of early intervention of TOA with catheter drainage or a surgery. In our clinical practice; we liberally used to consider inter-

ventional radiology for the drainage of the abscess in combination with the antibiotics. Laparoscopic approach is also conveniently used for the treatment of TOA in order to shorten the hospitalization period. In our study we have observed that the success rate of the catheter drainage increases with the increase of the size of the TOA. This can be explained by the experience of the interventional radiology unit and accessibility of the TOA with the increase of the size by transvaginal route. In this study the laparoscopy was successful in more than 60% of cases with size <8 cm. TOA >8 cm were managed either by transvaginal drainage or laparotomy. Open Access laparoscopy can be an option in abscess >8 cm for the prevention of complications and avoidance of laparotomy. In the study by Dewitt et al. mean duration of hospitalization was 4.6 days. In our study higher duration of hospitalization about one week despite of early intervention can be explained by low costs of hospitalization in our country.

The limitation of our study is the limited number of TOA with especially small sample size in patients TOA >8 cm. We believe that early treatment of tuboovarian abscess by drainage under the guidance of interventional radiology should be encouraged. Early laparoscopy may also be a surgical management option in experienced clinics in patients with abscess size <8 cm.

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