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Araştırma

Different Management Options for Tubo-Ovarian Abscess: A Tertiary Referral Center Experience

Hale Göksever Çelik*, Engin Çelik, Cenk Yaşa**, Semra Yüksel*, Serdal Çelik**, Özlem Dural**, Hasan Cemal Ark***

**Kanuni Sultan Süleyman Eğitim ve Araştırma Hastanesi, Kadın Hastalıkları ve Doğum Kliniği, İstanbul*
***İstanbul Üniversitesi İstanbul Tıp Fakültesi, Kadın Hastalıkları ve Doğum Kliniği, İstanbul*

ABSTRACT

Objective: *Tubo-ovarian abscess (TOA) is mostly a consequence of pelvic inflammatory disease (PID). TOA is characterized by an inflammatory mass involving the fallopian tube, ovary and occasionally other adjacent pelvic organs. TOA is a serious life-threatening condition that must be diagnosed and managed immediately. Complete history and pelvic examination includes the most important part of the diagnosis. Surgery is necessary for both definitive diagnosis and treatment of TOA especially for suspicious abscess rupture or finding of a TOA in a postmenopausal woman. Our objective was to compare characteristics of patients who undergo surgical treatment and medical treatment.*

Material and Method: *We examined 92 patients with TOA that had been hospitalized and treated medically or surgically. 53 patients had undergone operation and 39 patients had taken only antibiotherapy. Patients who underwent surgical treatment were called as Group 1 and took only medical treatment are called as Group 2.*

Results: *When patients treated surgically are divided into 2 groups which were operated as salpengectomy/salpingooopherectomy and drainage, difference in mean values between these two groups were not observed except WBC count. When we compared mean values of patients between Group 1 and 2, parity, antibiotherapy duration and hospitalization period were found different.*

Conclusion: *It's very important to decide that which patient should be hospitalized and treated with combination of surgical methods and antibiotherapy or which patient should take with only antibiotherapy. Correct decision will be helpful for patient reducing morbidity, adhesions, need for radical surgery and harmful to ovaries.*

Keywords: *abscess drainage, pelvic inflammatory disease, salpengectomy, salpingooopherectomy, tubo-ovarian abscess*

ÖZ

Tubo-Ovaryan Abselerde Farklı Yönetim Şekilleri: Üçüncü Basamak Hastane Deneyimi

Amaç: *Tubo-ovaryan abse çoğunlukla pelvik enflamatuvar hastalığın bir sonucudur. Tubo-ovaryan abse fallopian tüpleri, overleri ve sıklıkla diğer çevre pelvik organları da içeren inflamatuvar kitleyle karakterizedir. Tubo-ovaryan abse hızlıca tanı konulup yönetilmesi gereken ciddi yaşamı tehdit eden bir durumdur. Öykü ve pelvik muayene tanının en önemli kısmını oluşturur. Cerrahi hem kesin tanı hem de tedavide özellikle de şüpheli abse rüptüründe veya postmenopozal bir kadında tubo-ovaryan abse bulgusu mevcudiyetinde gereklidir. Amacımız cerrahi ve medikal tedavi alan hastaların karakteristik özelliklerini karşılaştırmaktı.*

Gereç ve Yöntem: *Tubo-ovaryan abse tanısı olup, hospitalize edilen ve medikal veya cerrahi olarak tedavi edilmiş 92 hastayı inceledik. Elli üç hasta opere edilerek, 39 hasta ise yalnızca antibiyotik alarak tedavi edilmişti.*

Bulgular: *Cerrahi ile tedavi olan hastalar Grup 1, yalnızca medikal tedavi alan hastalar ise Grup 2 olarak adlandırıldı. Bu iki grubun ortalama değerleri karşılaştırıldığında parite, antibiyotik ve hospitalizasyon süresi arasında farklılık bulundu.*

Sonuç: *Hangi hastanın hospitalize edilip cerrahi ve medikal tedavi kombinasyonuyla tedavi edileceği, hangi hastanın yalnızca antibiyotik alması gerektiğinin kararı çok önemlidir. Doğru karar morbiditeyi, yapışıklığı, radikal cerrahi gereksinimini ve overlere hasarı azaltarak hasta için yararlı olacaktır.*

Anahtar kelimeler: *abse drenajı, pelvik enflamatuar hastalık, salpenjektomi, salpingoooferektomi, tubo-ovaryan abse*

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Yazışma adresi: Uzm. Dr. Hale Göksever Çelik, Kanuni Sultan Süleyman Eğitim ve Araştırma Hastanesi, Kadın Hastalıkları ve Doğum Kliniği, Küçükçekmece / Istanbul
e-posta: hgoksever@yahoo.com

INTRODUCTION

Tubo-ovarian abscess (TOA) is mostly a consequence of pelvic inflammatory disease (PID); however endometritis, pyelonephritis, pelvic malignancy and any obstetric surgery may result in TOA. PID is caused by an ascending infection of lower genital tract organisms from the vagina or cervix into the uterus, fallopian tubes and peritoneal cavity [1]. TOA is characterized by an inflammatory mass involving the fallopian tube, ovary and occasionally other adjacent pelvic organs (eg. bladder, bowel) [2]. Tuboovarian complex must be differentiated from TOA that have a true abscess wall [3]. TOA can adhere to adjacent pelvic structures such as bowel, urinary bladder or omentum and this can result in elevated white blood cell count or fever. Polymicrobial infection with anaerobic bacteria predominantly cause TOA. The most commonly organisms that are isolated from TOA are Escherichia coli and Bacteroides species [4]. Gonorrhea and Chylamydia may have a role to facilitate infection, but rarely isolated from an abscess [5].

The risk factors for TOA are multiple sexual partners, age between 15 to 45 years and a prior history of PID. Modern intrauterine devices (IUD) cause little increased risk for PID and TOA [6].

Lower abdominal or pelvic pain and adnexal mass are most commonly encountered symptoms in patients with TOA. Fever and leukocytosis may be absent [7]. So absence of fever or elevated white blood cell count does not preclude the diagnosis of TOA. Vaginal discharge, nausea and abnormal vaginal bleeding may be present. Ruptured TOA may present with acute abdomen and signs of septic shock [8]. Elevated C-reactive protein (CRP) and especially erhtyrocyte sedimentation rate (ESR) (>50 mm/h) are good predictors for TOA [9,10]. Also these blood parameters are helpful for follow-up of treatment success.

TOA is a serious life-threatening condition that must be diagnosed and managed immediately. While mortality associated with TOA is dramatically decreased over last years prior to the advent of broad-spectrum antibiotics and modern surgical methods, morbidity associated with TOA remains significant. Because this can cause complications including infertility, ovarian ven thrombosis, chronic pelvic pain, pelvic thrombophlebitis and ectopic pregnancy [3].

Ruptured ovarian cysts, ovarian torsion, degenerated uterine fibroid, ectopic pregnancy or gastrointestinal pathologies such as appendicitis, gastroenteritis, irritable bowel syndrome or urinary tract pathologies (eg. pyelonephritis, nephrolithiasis) have similar symptoms and signs. Complete history and pelvic examination and then further tests includes the most important part of the diagnosis. Imaging studies such as ultrasonography, computed tomography (CT) or magnetic resonance imaging (MRI) are most helpful for differential diagnosis of TOA. Transvaginal ultrasound is important because it's inexpensive, expose no radiation to the patient and show an excellent image about lower genital tract. TOA are characterized by a complex multilocular cystic mass with thick irregular walls and internal echoes [11]. Pelvic CT or MRI is used to differentiate TOA from coexisting malignancy or gastrointestinal pathology.

Laparoscopy or laparotomy is necessary for both definitive diagnosis and treatment of TOA especially suspicious abscess rupture or finding of a TOA in a postmenopausal woman. Surgical exploration with removal of the involved tube and ovary and drainage of purulant fluid accumulated in pelvis is life saving [8]. Treatment modalities include broad spectrum antibiotics, minimally-invasive drainage procedures, invasive surgery or combination of these modalities. The choice of treatment modality depends on the status of the patient and the characteristics of the abscess. In women treated surgically, antibiotics should also be started as soon as possible. In an unstable patient suitable with abscess rupture, surgery should not be delayed for administration of antibiotics.

Our objective was to compare characteristics of patients who undergo surgical treatment and medical treatment. We also aimed to find any difference of characteristics according to size of TOA and different surgical techniques.

MATERIAL and METHOD

Our study was designed retrospectively. There was not ethical approval because we collected data of the patients from the records in archive and we did not document any personal information. Also in our

hospital, informed consent is taken from every patient about that medical information may be used in scientific publications. We examined 92 patients with TOA that had been hospitalized and treated medically or surgically in the Department of Obstetrics and Gynecology at Kanuni Sultan Suleyman Training and Research Hospital and Istanbul University Hospital between April 2014 and April 2015. 53 patients had undergone operation and 39 patients had taken only antibiotherapy. So patients who had been observed only or managed as outpatient were excluded from our study. Patients managed with antibiotics first and then surgical procedures because of failure in treatment were not included. No patients had two-step surgical treatment such as abscess drainage first and then salpingectomy/salpingooophorectomy or total abdominal hysterectomy and bilateral salpingoophorectomy.

TOA had been diagnosed mainly by transvaginal ultrasonography or any other imaging techniques like CT or MRI. Age, gravidity and parity, cesarean history, number of normal vaginal delivery, presence of intrauterine device (IUD), any chronic disease, operation history, size of the TOA, CRP level, white blood cell (WBC) count, antibiotic usage and duration, hospitalization period were recorded. If surgical treatment was applied, incision type, operation technique and any postoperative complication were also recorded. Mean TOA diameter had been measured in two dimensions.

All operations had been performed under general anesthesia. The first step in all operations had been confirmation of diagnosis of TOA. Salpingectomy/salpingooophorectomy and only abscess drainage had been applied in operation room. Salpingectomy had been performed as ligation, cutting and suturation of mesosalpinx and connection of the tuba and uterus. Salpingooophorectomy had been performed as ligation, cutting and suturation of infundibulopelvic ligament and uteroovarian ligament. Abscess drainage had been applied in cases which there was adhesions and borders of TOA could not been understood. Most of the abscess cavity and associated inflammatory fluid and debris had been removed as possible. Only 2 patients had undergone total abdominal hysterectomy and bilateral salpingoophorectomy. All removed tissues had been sent for pathologic evaluation. A drain had been left postoperatively until the patient improved clinically and output from the drain had been minimal.

Patients had usually taken gentamisin and clindamisin and/or ampisilin, penicilin and metranidazol, cephalosporin and metranidazol as antibiotherapy. So all regimens cover all associated bacteria.

Statistical Analysis: Statistical analysis were performed with SPSS software (Statistics Package for Social Sciences) version 16 for Windows. Difference in mean values and characteristics between groups is analyzed with independent samples t test, chi-square test and one way ANOVA test. Means were presented with standard deviation (SD). $p<.05$ was considered statistically significant.

RESULTS

The mean age of the patients was 39.1±9.6 years. Most of the patients were multiparous (89.1%), gave birth normally (77.2%), had no chronic illness (76.1%). The mean diameter of the TOA was 6.08±1.92 cm. The mean CRP level was 156.0±121.0, WBC count was 13550±5800 cells/μL. All patients had taken antibiotherapy for 11.11±4.44 days in average. The mean hospitalization period for all patients was 10.48±4.02 days. The other clinical and demographic characteristics were shown on Table 1.

Table 1. Demographic characteristics.

Characteristics	Number (no)	Percentage (%)
Parity		
Nulliparous	10	10.9
Multiparous	82	89.1
Vaginal birth		
Zero	21	22.8
≥1	71	77.2
Cesarian section		
Zero	76	82.6
≥1	16	17.4
IUD		
Absence	71	77.2
Presence	21	22.8
Chronic illness		
Absence	70	76.1
Presence	22	23.9
Operation history		
Absence	56	60.9
Presence	36	39.1

Table 2. Difference in mean values of characteristics between Group 1 and 2.

Characteristics	Group 1 (no:53)	Group 2 (no.39)	p
Age	39.72±7.91	38.18±11.54	.219
Parity (no)	2.3±1.1	1.8±1.7	.022
Size (cm)	6.38±1.78	5.67±2.06	.333
CA125 (U/ml)	92.80±132.87	58.22±57.12	.316
CRP	159.19±124.10	151.85±118.24	.820
WBC (103 cells/µL)	14.60±5.83	12.15±5.5	.716
Antibiyotherapy duration (days)	13.08±4.46	8.44±2.70	.003
Hospitalization (days)	11.83±4.28	8.64±2.78	.005

Table 3. Distribution of characteristics between Group 1 and 2.

Characteristics	Group 1 (no:53) (%)	Group 2 (no:39)(%)	P
Parity			.001
Nulliparous	1 (10%)	9 (90%)	
Multiparous	52 (63.4%)	30 (36.6%)	
Vaginal birth			.002
Zero	6 (28.6%)	15 (71.4%)	
≥1	47 (66.2%)	24 (33.8%)	
Cesarian section			.498
Zero	45 (59.2%)	31 (40.8%)	
≥1	8 (50%)	8 (50%)	
IUD			.650
Absence	40 (56.3%)	31 (43.7%)	
Presence	13 (61.9%)	8 (38.1%)	
Chronic illness			.000
Absence	49 (70%)	21 (30%)	
Presence	4 (18.2%)	18 (81.8%)	
Operation history			.000
Absence	45 (80.4%)	11 (19.6%)	
Presence	8 (22.2%)	28 (77.8%)	

Table 4. Distribution of characteristics according to the size of TOA.

Characteristics	TOA<6 cm (no:57)(%)	TOA≥6 cm (no:35)(%)	P
CA125 (U/ml)	78.85±130.65	91.11±110.70	.822
CRP	155.74±129.92	156.56±106.26	.145
WBC (103 cells/µL)	13.04±5.7	14.41±5.8	.534
Antibiyotherapy duration (days)	10.35±4.09	12.34±4.77	.206
Hospitalization (days)	10.00±3.78	11.26±4.33	.380
Treatment			.036
Medical	29 (74.4%)	10 (25.6%)	
Surgery	28 (52.8%)	25 (47.2%)	

Patients who underwent surgical treatment were called as Group 1 and took only medical treatment are called as Group 2. Higher parity, longer antibiotherapy duration and hospitalization period were observed in Group 1 patients (Table 2). The differences between 2 groups regarding parity, the number of vaginal birth, history of chronic illness and history of previous operation were statistically significant (Table 3).

We also compared the patients according to the size of TOA. There was not any statistically significant difference between the patients with different size of TOA (Table 4). Only difference was that patients with TOA size <6 cm were hospitalized and only took antibiotherapy without need for surgery mostly (p=0.036).

Total abdominal hysterectomy and bilateral salpingoophorectomy had been applied in only 2 patients. Excluding these 2 patients and comparing mean values of the patients according to different treatment modalities, differences regarding parity, antibiotherapy duration and hospitalization period were statistically

Table 5. Difference in characteristics of patients according to treatment modalities.

Characteristics	Salpengectomy / salpingoopherectomy (no.38)	Drainage (no.13)	Only medical treatment (no.39)	p
Age	39.55±7.15	40.23±10.26	38.18±11.55	.264
Parity (no)	2.38±1.23	2.15±1.07	1.82±1.73	.045
Size (cm)	6.3±1.8	6.5±1.8	5.7±2.1	.621
CA125 (U/ml)	104.54±146.32	45.83±24.60	58.22±57.13	.145
CRP	159.69±127.06	157.69±119.70	151.85±118.24	.966
WBC (103 cells/μL)	14.36±6.46	15.31±3.45	12.15±5.55	.128
Antibiyotherapy duration (days)	12.6±4.5	14.3±4.2	8.4±2.7	.015
Hospitalization (days)	12.0±4.6	11.3±3.4	8.6±2.8	.014

significant between groups (Table 5). Less parity number, shorter antibiotherapy duration and hospitalization period were found in patients who were given only medical treatment.

Salpingectomy/salpingooophorectomy had been done in 38 cases (74.5%) and only drainage had been applied in 13 cases (25.5%). Total abdominal hysterectomy and bilateral salpingoophorectomy had been applied in only 2 patients. Laparotomy was the surgical route mostly. Phanenstiel incision was preferred in 56.9% of cases, median incision was preferred in 25.5% of cases, laparoscopic route was preferred in 17.6% of cases.

DISCUSSION

The decision about hospitalization of the patient with PID or TOA and operation of this patient is critical because of the sequela of this condition. In past, patients were hospitalized for a prolonged period on intravenous antibiotics or underwent radical surgical treatment such as total abdominal hysterectomy and bilateral salpingoophorectomy. But at the present time, hospitalization rate for PID or TOA dramatically decrease [12]. Important point is to decide which patient should be hospitalized and which patient should be treated as outpatient. Approximately 25% of these patients experience long-term sequela such as adhesions and infertility [13]. Treatment modalities include broad spectrum antibiotics, minimally-invasive drainage procedures, invasive surgery or combination of these modalities. The choice of treatment modality depends on the status of the patient and the characteristics of the abscess.

TOA especially large ones necessitate surgical processes [4,14]. Laparoscopy or laparotomy is necessary for both definitive diagnosis and treatment of TOA. Surgical exploration with removal of the involved tube and ovary and drainage of purulant fluid accumulated in pelvis is life saving [8].

Broad spectrum parenteral antibiotherapy decrease need for surgery in treatment of TOA. Although no data are available to formally guide length of antibiotherapy, 10 to 14 days is usually effective. If relief of pain or improvement of symptoms does not occur, surgery is unavoidable. Larger size of abscess and older age of patients are associated with increased duration of hospitalization and increased need for surgery [4,9]. Radiographic size and parity are also important for surgical intervention [15]. Combination of conservative surgical procedures such as intravenous antibiotherapy and unilateral salpingooophorectomy reduce more radical surgery such as total abdominal hysterectomy and bilateral salpingooophorectomy or repair of bowel injury. Percutaneous drainage guided with imaging methods and laparoscopic treatment of TOA are popular treatment options that has been used successfully to drain intraabdominal abscess collections without requiring surgery [5]. The surgical approach can change according to the skill of the surgeon. Surgeries for TOA can result in severe complications because of the extensive adhesions to the adjacent organs.

Higher parity, longer antibiotherapy duration and hospitalization period were observed in the patients treated with surgical methods. The reason for higher parity in Group 1 was thought that in parous women, more aggressive and longer treatment was needed because of broad spectrum pathogens that were sexually transmitted. Also antibiotherapy duration and hospitalization period in Group 1 was longer because of resistant TOA in which preoperative and postoperative

antibiotherapy was necessitated.

As mentioned before, TOA mostly results from ascending infections of lower genital tract organisms. So patients who were parous and gave birth normally had higher risk for ascending infection and needed much more surgical treatment.

We did not identify any statistically significant difference between patients who were applied salpingectomy/salpingooophorectomy and only abscess drainage. It is thought that surgical management has become much more conservative for protection of the ovarian reserve with widespread use of the effective antibiotic treatment. Only difference found was lower WBC count in salpingectomy/salpingooophorectomy. This finding could be explained as that cases which had ruptured TOA with diffuse content, undefined borders and more adhesions in pelvis underwent drainage. So these patients had higher inflammatory response and higher WBC count.

It's important to emphasize that early suspicion of TOA is significant for diagnosis. Treatment must be a combination of parenteral antibiotics and early surgical procedure [16]. Early diagnosis and management reduces spreading of abscess in pelvis which will result in more adhesions and more morbidity. It's very important to decide that which patient should be hospitalized and treated with combination of surgical methods and antibiotherapy or only antibiotherapy without the need of the surgery.

Our study has limitations. Our study had retrospective design. Additionally more prospective studies with more patients are needed to better understand which treatment modality is more effective, less complicated and less harmful for ovarian reserve.

CONCLUSION

The determination of the treatment modality of TOA is crucial in reducing morbidity, adhesions, need for radical surgery and giving less harm to ovaries.

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