

Original Research Article

Iliopsoas abscess: clinical presentation, management, and outcome

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ABSTRACT

Background: The aim of this study was to review our experience with iliopsoas abscesses (IPAs) and evaluate the various drainage procedures.

Methods: All consecutive patients with an IPA admitted to three university hospitals between September 2008 and June 2017 were retrospectively included.

Results: Of the 26 patients, 17 (65.4%) were male and nine (34.6%) were female, with an average age of 30.7 (17-58) years. Fifteen (57.7%) cases had primary IPAs and *Staphylococcus* spp. was the most common isolate. Eleven (42.3%) cases had secondary IPAs, and spinal tuberculosis was the most common underlying condition. Lower-back or flank pain was the most common presentation (69.2%). Computed tomography (CT) scans confirmed all clinical diagnoses. All patients were managed via drainage and antibiotic therapy; seven (26.9%) were subjected to open surgical drainage and 19 (73.1%) received percutaneous drainage (PCD) under ultrasound (US) guidance. The average hospital stay was 9.5 days (range 5-18 days). The hospital stay was significantly shorter in patients treated via PCD compared to those who received open drainage: 8.5 days (range 5-14 days) vs. 12.1 days (range 6-18 days), respectively ($p = 0.031$). The overall recurrence rate was 11.5% (3/26). Recurrence developed in three patients treated via US-guided PCD and all were successfully treated via a second round of PCD. No mortality was recorded.

Conclusions: US-guided PCD combined with appropriate antibiotic therapy is safe and effective with shorter hospital stay when used to treat IPAs. Open surgical drainage may be warranted if the IPA is multiloculated or if there is an underlying pathology.

Keywords: Iliopsoas abscess, Drainage, Outcome, Ultrasound

INTRODUCTION

An iliopsoas abscess (IPA) is uncommon; most of the relevant literature is in the form of case reports and short case series.¹ A primary IPA reflects hematogenous spread from an occult source of infection, whereas a secondary IPA reflects a direct extension of infection from an adjacent organ.^{2,3} The symptoms and signs of an IPA may

be vague, nonspecific, and misleading.^{4,5} The classical triad of pain, fever, and limp, described by Mynter in 1881, is atypical and rarely seen.⁶ However, computed tomography (CT) and magnetic resonance imaging (MRI) are increasingly used to diagnose patients with nonspecific symptoms, and IPAs are now more commonly found prior to the development of specific clinical signs.^{7,8} Treatment consists of adequate drainage

(either surgical or percutaneous) and appropriate antibiotic therapy.⁹ Percutaneous drainage (PCD) is traditionally used to treat intra-abdominal or pelvic abscesses, and is now the first-line treatment for an IPA.^{7,10} PCD under ultrasound (US) guidance is preferable to open surgical drainage, being less invasive and associated with a shorter hospital stay. CT-guided PCD is more expensive and associated with radiation hazard. We review our experience with IPAs and evaluate the various drainage procedures.

METHODS

The medical records of 26 consecutive patients admitted to three university hospitals (Benghazi Medical Center, Al-hawari Urology Center and Al-Jala hospital) in Benghazi, Libya, between September 2008 and June 2017, were retrospectively reviewed. Authors recorded disease etiologies, clinical characteristics, laboratory findings, microbiological and radiological data (US and CT), treatments, and outcomes. Abscesses were drained using either a conventional extraperitoneal approach or via PCD under US guidance. The choice of performing PCD is dependent on surgeons and radiologist experience and technical accessibility of abscess while open surgical drainage may be warranted in multiloculated IPA.

Procedure details

PCD was performed under US guidance. Under US guidance, the entry site was marked, and an approach remote from major blood vessels and other organs was planned. Under local anesthesia, a wide-bore needle was inserted into the target area under US guidance, and the fluid was aspirated. Next, a catheter (nephrostomy tube, 14-16 Fr; or a chest tube, No. 24) was inserted into the cavity and connected to a non-suction drainage system. In all cases, open and PCD, the drain was not removed until no further fluid came out and the abscess had completely disappeared on follow-up US.

Empirical broad-spectrum intravenous antibiotic therapy (ceftriaxone and metronidazole) commenced immediately for all patients; the antibiotics were later changed according to the results of culture and sensitivity tests. Patients kept on antibiotics for 2-3 weeks and those who discharged earlier they were advised to continue on oral antibiotics thereafter. Patients who came up with tuberculous abscess results received anti-tuberculous therapy and followed-up by a respiratory team.

Statistical analysis

All analyses were performed with the aid of SPSS version 18.0. Student's t-test was used for analysis of continuous variables, Mann-Whitney test was used for nonparametric variables and the chi-squared test was used for categorical variables. A p value <0.05 was considered to indicate statistical significance.

RESULTS

Authors treated 17 (65.4%) males and nine (34.6%) females with an average age of 30.7 (17-58) years. Fifteen (57.7%) patients had primary IPAs and 11 (42.3%) had secondary IPAs.

Staphylococcus aureus was the most common organism isolated from the former group (66.7%). Tuberculosis of the spine was the underlying condition in nine (81.8%) patients with secondary IPAs and urinary tract infections were the causes of two (18.2%) such cases.

Table 1: Clinical presentations on admission.

Clinical presentation	No. (%) of patients
Fever	12 (46.1%)
Low back/ flank pain	18 (69.2%)
Groin/ flank mass	10 (38.5%)
Flexion contraction	8 (30.7%)
Weight loss	15 (57.7%)
Anemia	14 (53.8%)
Leukocytosis	15 (57.7%)

Lower back or flank pain was the most common manifestation (69.2%). Leukocytosis was the most common laboratory finding (57.7%). The clinical presentations on admission are shown in Table 1. Positive blood cultures were obtained from eleven patients (42.3%) and positive pus cultures were obtained from fourteen patients (53.8%).

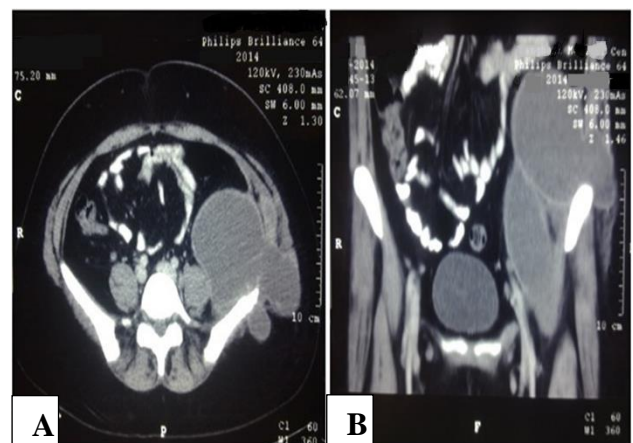


Figure 1: (A and B) A CT scan of the abdomen and pelvis shows a large left-side secondary iliopsoas abscess extending to the anterior abdominal wall and left groin of a young female.

Of the 26 patients, four (15.4%) initially had negative US findings. CT scans confirmed the clinical diagnoses of all patients (Figures 1 and 2), who were managed via drainage and antibiotic therapy.

In all, seven patients (26.9%) underwent open surgical drainage and 19 (73.1%) received PCD under US

guidance. No patient received antibiotics alone. No drainage-related complications were noted, (Table 2).



Figure 2: (A and B) A CT scan shows a right-side iliopsoas abscess in a 17-year-old female.

Table 2: Characteristics and outcomes of patients according to treatment received.

	Open drainage (n = 7)	PCD (n = 19)	P value
Primary	6 (85.7)	9 (47.4)	
Secondary	1 (14.3)	10 (52.6)	
Length of stay, (days)	12.1 (6-18)	8.5 (5-14)	p = 0.031
Drainage time, (days)	5.3 (4-7)	15.4 (4-29)	p = 0.018
Recurrence	0	3 (15.8)	P = 0.264
Mortality	0	0	

Data are presented as mean (range) or n (%); n = number; PCD = percutaneous drainage.

The average duration of drainage was 12.6 days (range 4-45 days). The average duration differed between those treated via PCD and open drainage (15.4 days (range 4-

29 days) vs. 5.3 days (range 4-7 days); $p = 0.018$). Further, the average duration of drainage was significantly higher in secondary than primary IPA ($p = 0.027$), (Table 3).

The average hospital stay was 9.5 days (range 5-18 days). The hospital stay was significantly shorter in patients treated via PCD compared to those who received open drainage: 8.5 days (range 5-14 days) vs. 12.1 days (range 6-18 days), respectively ($p = 0.031$).

The average duration of outpatient follow-up was 7.2 months (5-22 months). The overall recurrence rate was 11.5% (3/26). No recurrence was noted in patients treated via open surgical drainage. Of the 19 patients who underwent PCD, three (15.8%) presented with recurrence 3-6 months into their follow-up periods.

Two primary IPA cases and one secondary IPA (spinal tuberculosis) patient experienced recurrence and were successfully managed via repeat PCD under US guidance. No mortality was recorded. Table 4 compares the US-guided PCD and open drainage in patients with primary and secondary IPA.

Table 3: Characteristics and outcomes of primary and secondary IPA patients.

	Primary (n = 15)	Secondary (n = 11)	P value
Age, (years)	30.1 (19-58)	30.5 (17-55)	P = 0.772
Sex			
Male	11 (73.3)	6 (54.5)	
Female	4 (26.7)	5 (45.5)	
Length of stay, (days)	9.8 (5-17)	9 (5-18)	P = 0.583
Drainage time, (days)	9.1 (4-22)	17.5 (5-45)	P = 0.027
Recurrence	2 (13.3%)	1 (9.1%)	P = 0.738
Mortality	0	0	

Data are presented as mean (range) or n (%); n= number.

Table 4: Comparison of the US-guided PCD and open drainage in patients with primary and secondary IPA.

	Primary IPA			Secondary IPA		
	Open drainage (n = 6)	PCD (n = 9)	P value	Open drainage (n = 1)	PCD (n = 10)	P value
Length of stay, (days)	11.1 (6-17)	9 (5-12)	p = 0.117	18	8.1 (5-14)	p = 0.109
Drainage time, (days)	5.1 (4-7)	11.6 (4-22)	p = 0.023	6	18.7 (5-45)	p = 0.206
Recurrence	0	2 (22.2)	P = 0.343	0	1 (10)	P = 0.909
Mortality	0	0		0	0	

Data are presented as mean (range) or n (%); IPA= iliopsoas abscess; n= number; PCD = percutaneous drainage.

DISCUSSION

In 1992, 12 cases per year of IPA were reported worldwide, significantly higher than the 3.9 cases per

year prior to 1985.¹¹ The true incidence of the condition is unknown.¹² However, the literature indicates that the condition is becoming more increasing worldwide. In 1997, Gupta et al, studied 51 patients in India.¹³ Yacoub et al, in 2008, reported on a series of 41 patients in California.¹² In 2009, Tabrizian et al, described a series of 61 patients in New York.⁶ Navarro-López et al, in 2009, reported on a large series of 124 patients in Spain.¹⁴ In 2013, Kim et al, described a series of 116 patients in Korea.²

In 1986, Ricci et al reviewed 367 cases of IPA described in the literature and found that 70% were primary IPAs (recorded principally in developing countries).¹⁵ Secondary abscesses were exclusive to developed countries. In the present study, 15 (57.7%) cases were primary IPAs and 11 (42.3%) were secondary IPAs.

Medical conditions that trigger immunosuppression (diabetes mellitus, HIV infection, steroid therapy, chemotherapy) are risk factors for the development of a primary IPA.⁹ None of our patients exhibited such risk factors. *S. aureus* was the most common (66.7%) causative organism in primary IPA patients, consistent with the literature.^{1,9,11,14,15} No methicillin-resistant *S. aureus* was noted.

The most common etiology of a secondary IPA is Crohn's disease.^{6,15} Wong et al, found that spondylitis (spondylodiscitis with disc involvement) was the most common etiology of secondary psoas abscesses, no case of which was associated with Crohn's disease.⁹ Authors found that most (9/11; 81.8%) secondary IPAs were attributable to *Mycobacterium tuberculosis*, followed by urinary tract infections (2/11; 18.1%).

IPAs are frequently missed at initial presentation.⁹ In the present study, the classical triad of back pain, limp, and fever was not commonly present; lower back/flank pain was the most common symptom (69.2%), and was usually nonspecific, consistent with previous studies.^{5-7,9,11,13}

CT is the imaging mode of choice for IPA detection.^{4-6,9,11,16} In Tabrizian et al, 89% (54 of 61) of patients were diagnosed by CT.⁶ Wong et al, reported that, in 95% (40/42) of all cases, IPAs were diagnosed via CT.⁹ Taiwo et al, considered CT to be the diagnostic mode of choice; the sensitivity approached 100%, consistent with our findings.¹⁶

Mueller et al, were the first to use PCD to treat an IPA, in 1984.¹⁷ Presently, imaging-guided PCD is in widespread use.¹⁰ Although PCD is the method of choice for IPA treatment, the question of whether IPA PCD should be guided by US or CT remains controversial. To the best of our knowledge, the literature contains no direct comparison of the two techniques. Many clinicians prefer CT guidance because CT reveals the entire abscess, which is not always possible on US because of the

interference of overlying bowel gas. In addition, CT permits better visualization of possible associated pathologies in adjacent structures.¹⁰ In the present study, US-guided PCD cured 73.1% of patients and the rate of recurrence, re-treated successfully via US-guided PCD, was acceptable. We recommend US-guided PCD to treat IPA. The entire procedure can be managed in real-time, the approach is inexpensive, the equipment is widely available, and there is no radiation hazard.

In the present study, the overall average drainage duration was 12.6 days. The average duration of PCD was significantly higher than that of open drainage (15.4 vs. 5.3 days). This may be because PCD does not allow the surgical debridement and complete evacuation of the abscess that is possible with open drainage. Cantasdemir et al reported a mean PCD duration of 59.7 days.¹⁰ This long period was because the criteria set for catheter removal were very strict, and relatively large volumes of abscess were drained compared to those of other studies. Dinc et al, reported an average PCD duration of 12 days.¹⁸ Gupta et al, reported an average PCD time of 11 days in patients with tuberculous iliopsoas abscesses; the figure of Staatz et al, who treated similar patients, was 31.1 days.^{13,19} Present study data are consistent with those of Gupta et al, and Dinc et al.^{13,18} Variation in drainage duration may reflect differences in abscess size and/or catheter diameter.

The length of hospital stay was significantly shorter in patients treated via PCD compared to those who had received open drainage; the overall average length of hospital stay was 9.5 days. Tabrizian et al, reported a mean hospital stay of 25 days and Cantasdemir et al, reported a mean of 11.5 days.^{6,10} Yacoub et al.¹² reported a median hospital stay of 29 days. The average duration of hospital stay of the patients in the present study was close to that of Cantasdemir et al.¹⁰ The shorter hospital stay in our study may be attributable to rapid diagnosis due to increased use of CT and possibly because of the early discharge of the patients with drainage catheters (especially those treated with PCD), with follow up as outpatients.

Overall recurrence rate in present study was 11.5% (3/26). Two other studies reported recurrence rates of 14.3% and 9.7% respectively.^{10,12} In contrast, Baier et al, reported a relatively high recurrence rate of 37.5%. There was no underlying pathology was found to explain the recurrence in the present study.²⁰ However, the reasons for recurrence in those three patients were probably due to early removal of the drainage catheter. In primary IPAs, drainage catheter was removed on the 4th postoperative day in one patient and on the 7th in the other patient while for the patient with the tuberculous abscess the drain was removed on the 5th postoperative day.

Kim et al, Tabrizian et al, and Yacoub et al, reported mortality rates of 11.2%, 5%, and 3%, respectively.^{2,6,12}

Baier et al, reported a mortality rate of 15% (6/40); all patients were treated via open access drainage. Three patients died of sepsis and three died of cardiac failure (ischemic heart attacks).²⁰ Authors experienced no mortality, possibly because most of studied patients were young and lacked comorbidities.

CONCLUSION

US-guided PCD along with appropriate antibiotic therapy is a safe and effective front-line treatment in IPA. However, open surgical drainage is indicated if the IPA is multiloculated or if there is an underlying pathology warranting definitive surgery.

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