

ORIGINAL ARTICLE

Role Of Laparoscopy In The Management Of Paravertebral/Psoas Abscess–A Pilot Study

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Abstract

Background: Psoas abscess is considered to be rare globally, however, may not be so rare in Nigeria or the West African sub region. Open or percutaneous

Aim: To highlight our experience with the management of paravertebral/psoas abscess laparoscopically

Methods: This is an unrandomized prospective observational study done over an 18 months period involving adults diagnosed clinically and by imaging with paravertebral/psoas abscess and purchasing care from a public and private health care facility in Nigeria where they received laparoscopic drainage of the abscess. Each patient was followed up monthly for a minimum of six months post procedure by clinical and imaging evaluation.

drainage is frequently the common modality for treating the condition. Laparoscopic drainage of the abscess is rare in Nigeria.

Results: An immediate relief of all symptoms was experienced by all patients within 48 hours post procedure. The ESR and CRP levels steadily dropped in the post operative period and repeat imaging [CT/MRI] did not demonstrate a residual abscess cavity during follow up.

Conclusion: Laparoscopic management of paravertebral/psoas abscess would appear to be associated with a complete pus drainage, no recurrence, and, full recovery from the disease.

Keywords: Paravertebral/ psoas abscess, laparoscopic drainage, complete symptomatic resolution.

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Introduction

Psoas abscess is rare with an incidence of 0.4/100,000¹. It may present with low-, or high-grade fever, loin and back pains, fixed flexion deformity of the lower limb and inability to stand and walk²⁻⁴. It can be quite debilitating because of the risk to neuromuscular deficits, septic shock and death⁵.

Often, the diagnosis of paravertebral/psoas abscess is made late because of late presentation by patient or a low index of suspicion from the clinician. A high index of suspicion of the disease among first line clinicians is important in diagnosing and treating the disease.⁶ Laparoscopic drainage of psoas abscess does not necessarily require image guide as the laparoscopic surgeon has direct visualization of the abscess cavity and can make real time assessment and decisions on the management approach. Laparoscopic drainage has all the advantages of a minimal access procedure but in particular it can be performed on the very ill. It is a minimally invasive procedure as compared to open surgery. Open surgery may aggravate systemic inflammatory response syndrome and multiple organ dysfunction in the very sick and infant patients which may delay recovery.

Percutaneous drainage of psoas abscess under image guidance in combination with broad spectrum antibiotics is a known modality in managing psoas abscess. However, it may not achieve complete drainage of the abscess especially where the abscess cavity is large, leading to recurrent disease.⁷⁻⁹ C-T scan is the imaging modality of choice to guide the procedure. There is widespread paucity of this imaging modality in the West African sub-region implying that guided drainage may not be feasible in much of the region. Percutaneous drainage may be very difficult where there is lack of technically trained manpower and in

technically difficult percutaneous procedure¹⁰⁻¹². Also, failure may occur if there is extensive phlegmonous visceral affectation.¹³⁻¹⁵

Psoas abscess may be of primary or secondary origin. The secondary disease may arise from hematogenous spread of infection from distant sites like skin infections. It may also arise from extension of infection from an adjacent tissue as in tuberculosis of the spine and kidneys. Literature on the experience with open and percutaneous drainage of psoas abscess is commonly available but that of laparoscopic drainage and its outcomes is tenuous¹⁶⁻²⁰. We present our limited experience on laparoscopic drainage of psoas/ paravertebral abscess.

Materials and method

This is a prospective study of 18 months June 2022 to January 2024 done in the setting of a private laparoscopy center and public hospital, in which consecutive patients who presented with symptoms, sign and laboratory and imaging diagnosis of psoas/paravertebral abscess were included. Inclusion criteria was based on patients who presented with confirmed diagnosis of psoas abscess who were declared fit for general anaesthesia, based on their ASA status irrespective of their age. Those that presented with the co-morbidity of hypertension and diabetes were stabilized before surgery. The minimum set of investigations are a complete blood count, urinalysis, and serum electrolytes and creatinine. Other investigations include erythrocyte sedimentation rate, c-reactive protein and C-T scan and or MRI. Clinical outcomes were evaluated based on the changes observed on pre-operative and post-operative physical examination and assessment of loin/back pains, fever and inability to walk, inflammatory marker testing, C-T scan and or

magnetic resonance imaging. All the investigations were repeated post procedure to compare their values with the initial value. All the indices were recorded on a proforma and data analysis was done using SPSS version 26 IBM incorporated Chicago-Illinois.

In the operative procedure of laparoscopy for psoas/paravertebral abscess drainage, the classical ipsilateral port placement was adopted depending on the side of the psoas that is involved. If both sides are involved both ipsilateral ports are utilized for better access. A standard 3 port technique was instituted with patient in the supine position under general anaesthesia after routine cleansing and draping of the abdomen. The telescopic 10mm port was via the umbilicus by the Veress method of creating pneumoperitoneum. Two other 5 mm ports of access into the abdomen were created according to the base-ball diamond concept at 5cm from both sides of the umbilical port. Through these 5mm ports, hand instruments that will be used for dissection and opening into the abscess cavities were introduced into the abdomen. Diagnostic laparoscopy was first done to determine the extent of the disease. The peritoneum covering the paracolic gutter was incised with the laparoscopic scissors and incision deepened with the laparoscopic suction hand instrument to drain an avalanche of abscess located in the psoas/paravertebral area. Laparoscopic suction irrigation enhanced the breaking of pockets of loculi with complete drainage of the abscess and evacuation of peritoneal spillage. Surgery ended with the withdrawal of all laparoscopic instruments from the peritoneal cavity and closure of abdominal ports with subcuticular 2/0 vicryl sutures while a specimen of the abscess was sent for analysis. In our study, we did laparoscopic psoas/paravertebral abscess drainage for twenty patients in two centers: George and Martin[G/M] minimal access center Ore Ondo

state [a private specialist center] and the University of Nigeria Teaching Hospital Enugu. 18 patients had laparoscopic drainage and were followed up for 6 months in G and M minimal access center while 2 patients were done in UNTH Enugu and also followed up for 6 months. All cases were satisfactory post-operatively and no patient required extra intervention or open surgery thereafter. The tailored prophylactic broad-spectrum antibiotics meropenem was administered to all patients and continued for one week after surgery and there were no incidence of intra-abdominal sepsis, septicaemia or port site wound infection.

Results

In our study we did laparoscopic psoas/paravertebral abscess drainage for 20 patients in 2 centers: George and Martin minimal access center Ore Ondo state Nigeria [a private specialist center] and the University of Nigeria Teaching Hospital, Enugu. Of the twenty patients that were managed 12 [60%] were males while 8 [40%] were females showing a M: F ratio of 1.5:1. Figures 1 and 2 shows the pre and post operative MRI respectively. The mean age of the patient was 50.2 ± 7.8 and the age range involved is 40-69 years as in table 1. 10% of the patients were previously on anticancer regime while another 10.1% were previously on anti-tuberculous regime as in table 2. Apart from analgesic intake, majority of the patients 16 [80%] were not on any other known medication. The mean levels of WBC was $11,165 \pm 2306$ /microliter as in figure 3 while the mean level of ESR was 124.25 ± 7.69 mm/hr as in figure 4. The mean CRP was 6.2 ± 1.67 mg/L as in figure 5. Unilateral abscess presentation was 14 [70%] of the patients while bilateral abscess collection was 6 [30%] of the cases seen. In Table 3 Staphylococcus was the isolated organism in samples taken in 13 [65%] of the cases while Mycobacteria was isolated in 7 [35%] of cases.

At a follow up period at 6 months the values of WBC, ESR and CRP returned to normal and there were no recurrent abscesses after a repeat CT and MRI scan. At this stage, all the patients were

free from severe back pain and were able to stand and ambulate without support. No other obvious complications were observed.

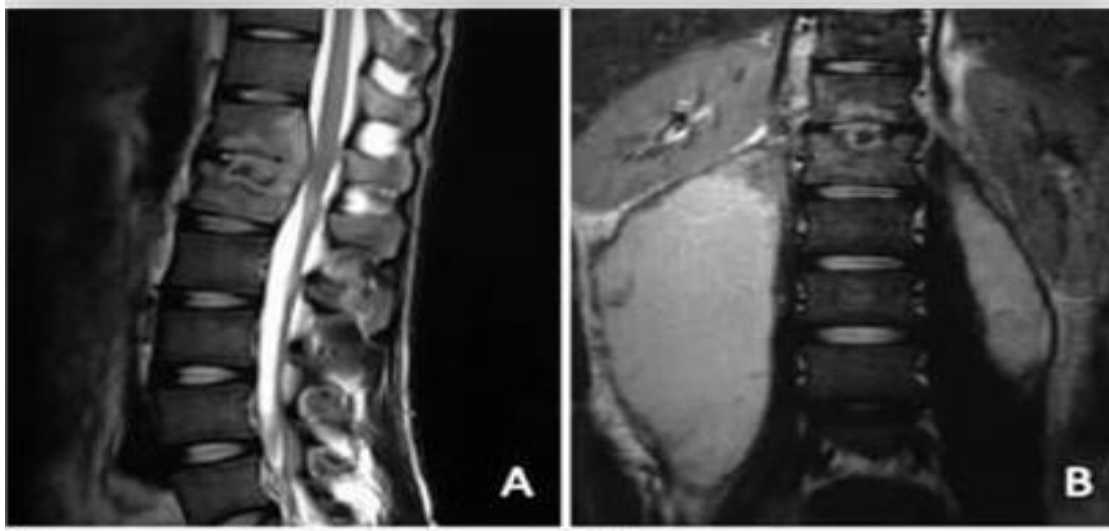


Figure 1. MRI showed bilateral psoas abscess in a male patient. A-Sagittal T2-weighted MRI demonstrated it. B-Coronal T2-weighted MRI demonstrated upward displacement of the right kidney because of the right huge psoas abscess.

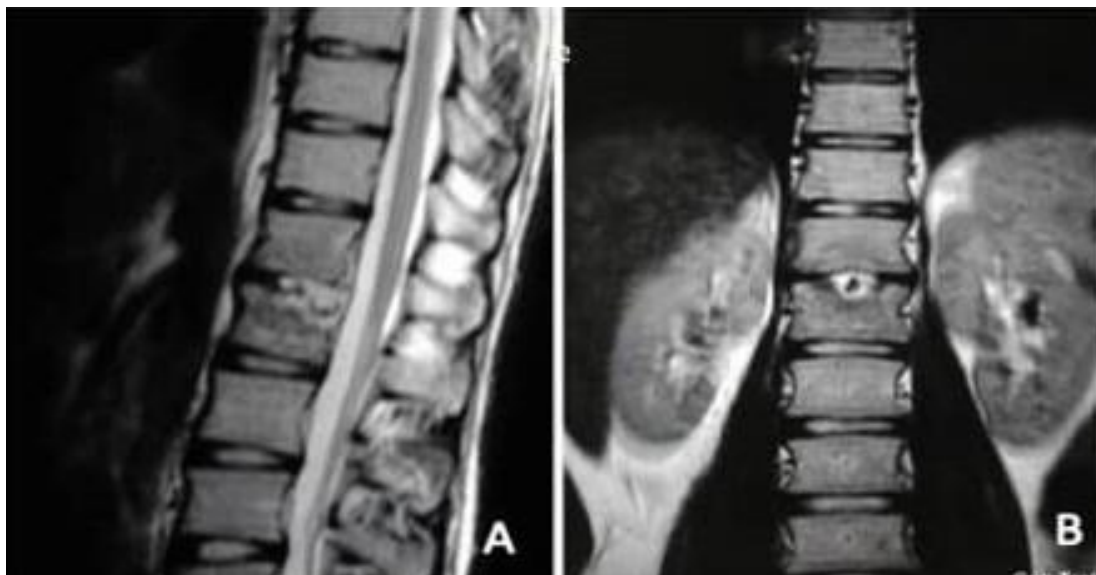


Figure 2. MRI showed disease control after 6 months of laparoscopic surgery. Right kidney was back to its normal place and no abscess were observed in the bilateral psoas muscles in the coronal plane

Table 1 Age group of patients presenting with paravertebral/psoas abscess

Age Bracket [Yrs]	Frequency	Percent
40-49	6	30.0
50-59	7	35.0
60-69	7	35.0
TOTAL	20	100.0

Table 2 Showing previous drug therapy of the patient

Previous Drug Therapy	Frequency	Percentage
Analgesics only	16	80
Analgesics and anti-tuberculous drugs	2	10
Analgesics and anti-cancer drugs	2	10
Total	20	100

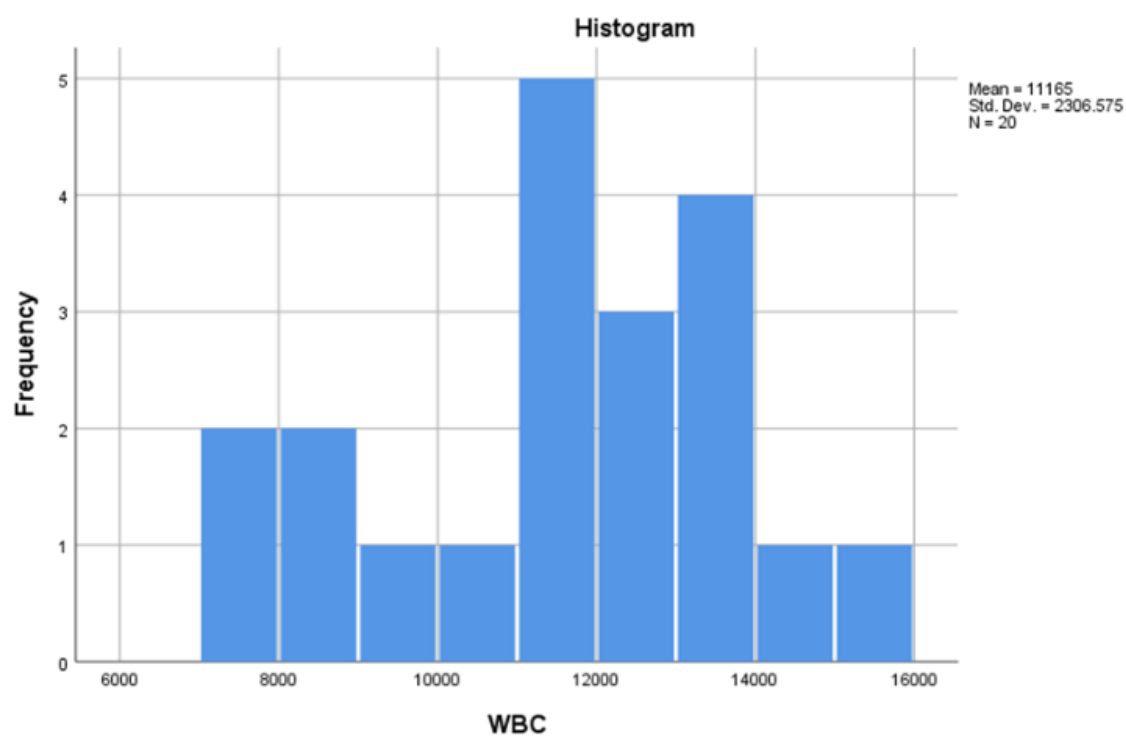


Figure 3 showing levels of WBC in the patients

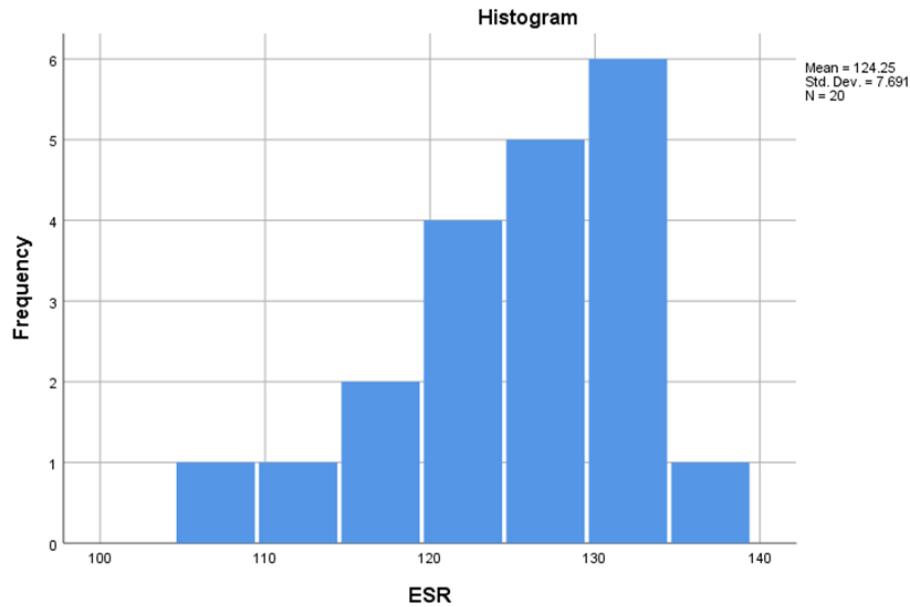


Figure 4 showing levels of ESR in the patients

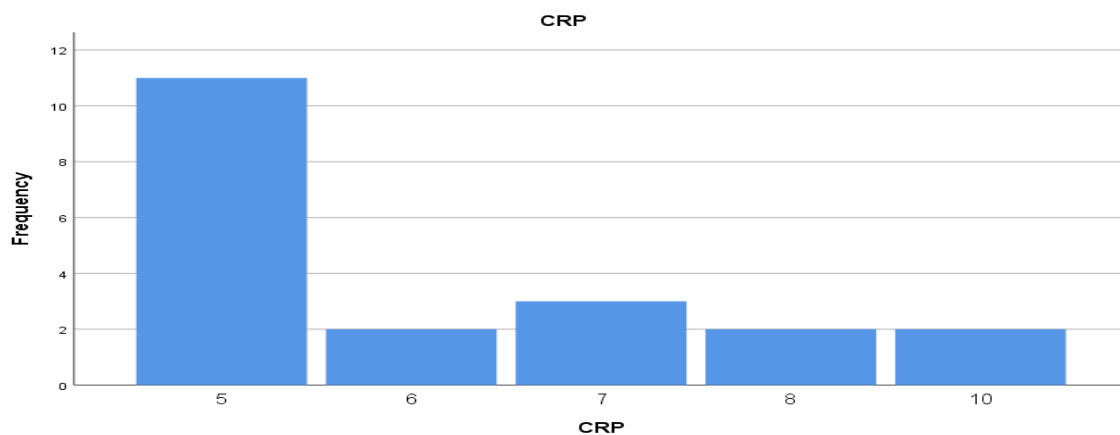


Figure 5 Showing the frequency of CRP in the patients

Table 3 showing frequency of isolated organism in samples

Pus Culture Yield	Frequency	Percentage (%)
Staphylococcus	13	65
Mycobacterium tuberculosis	7	35
Total	20	100

Discussion

All our patients preferred minimal access than open procedure and so laparoscopic surgery was done for all of them after failed percutaneous drainage. Minimally invasive approaches in the management of psoas/paravertebral abscess have been based on the percutaneous method. However, in recent times laparoscopic drainage is done and found efficacious in the management of paravertebral/psoas abscess. There is slight male preponderance in our cases 60% and a predisposition to middle age-mean age 50 years. This is not in keeping with similar work in literature where there is equal sex distribution and majority of patients are elderly, over 70 years of age.²¹ A minority of our patients were already on anti-tuberculous 10% and anti-cancer regime 10% at presentation. However, majority were not on this therapy and as such we cannot effectively attribute abscess formation to these anti tuberculous and anti-cancer drugs. The role of laparoscopy as shown in our work has facilitated the complete drainage of large quantity of thick multiloculated abscess that were difficult to drain via the percutaneous method. This played out in our patients who had psoas/paravertebral abscesses that was not resolved by initial percutaneous method of abscess drainage. Open surgery with its attendant increased morbidity may be risky in these patients who are usually frail. Our patients did not have serious neurological impairment or angular kyphotic deformity. This mode of presentation was seen in certain studies²². The main symptoms were severe back pain necessitating inability to stand and walk. As a result, the management strategy was focused on minimally invasive laparoscopic debridement and drainage of multiloculated abscess in addition to antibiotic chemotherapy systemically. Some studies have applied local chemotherapy by way of percutaneous

instillation of anti-tuberculous or antibacterial agents into the paravertebral space^{22,23}. This is said to be efficacious, however in our study we did not embark on such. The systemic therapy in our own cases were not associated with recurrence of the previous collection and such remained our practice.

All our patients complained of waist and flank pain and inability to walk in keeping with studies on paravertebral/psoas abscess, as the iliopsoas is a major flexor muscle of the hip^{24,25,26}. A psoas abscess can also paralyze and distend the intestines presenting with asymmetric enlargement of the abdomen. This was seen in one of our patients with swollen right lower quadrant of the abdomen. This can lead to misdiagnosis and appropriate treatment delayed or wrong treatment given.²⁷ However, evaluation with contrast enhanced CT and MRI scan has been helpful in establishing the diagnosis of paravertebral/psoas abscess²⁸. An elevated leukocyte count, an elevated ESR and CRP levels are typical laboratory findings of psoas abscess patients compared to those with degenerative spinal diseases as seen in our patients. In general, the extent of ESR and CRP elevation reflects the extent of inflammation. However, there is rapid decline of ESR and CRP after drainage as seen in our cases as compared to previous work done elsewhere.²⁹

As is true of open surgical drainage, laparoscopic drainage allows complete drainage. It is however less invasive than open surgery. Laparoscopy reduces postoperative wound complications, shortens hospitalization and facilitates rapid recovery³⁰. Rapid drainage is essential for septic patients with extensive paravertebral collection. In such a situation the slow percutaneous catheter drainage may be fatal, and open drainage may be dangerous because of its invasiveness. Laparoscopic

drainage is very effective with a shorter operative time and less invasiveness compared to open surgery. In our study most of the samples taken at surgery were of staphylococcus aureus in 70% and mycobacteria in 30%. However, none of our patients was positive to human immunodeficiency virus.

Nevertheless, orthopedic or neurosurgical specialist who experience and treat a lot of this debilitating disease should team up with general/laparoscopic surgeon towards effective management of this disease of paravertebral or psoas abscess.

Limitations to our study

A limited number of patients was involved in our study. Further studies involving many patients will need to be done in future.

Conclusion

Laparoscopic drainage of psoas abscess has a low incidence of disease recurrence and is recommended where the requisite facilities and technical manpower are available.

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Conflict of Interest: Nil

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