European Journal of Molecular & Clinical Medicine

ISSN 2515-8260 Volume 10, Issue 01, 2023

**ORIGINAL RESEARCH**

# Testicular Abscess And Acute Epididymitis Progressing To Testicular Ischemia Leading To Inevitable Orchidectomy: A Retrospective Observational Study

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Received Date: 11/11/2022 Acceptance Date: 08/01/2023

**ABSTRACT**

**Background: Acute epididymorchitis is an inflammatory condition of the testis and the spermatic cord usually controlled by antibiotics and conservative management, rarely it leads to abscess formation and ischemia of testis inadvertently leading to orchidectomy, through this paper we try to devise causes of increased orchidectomies in such cases in our hospital like multidrug resistant bacteria causing epididymo-orchitis, compartment syndrome, klebsiella. Aim: to identify cause of increased orchidectomies in patients of both acute epididymo-orchitis and testicular abscess. Objective: Testicular abscess and acute epididymitis progressing to testicular ischemia leading to inevitable orchidectomy: a retrospective study.**

**Methodology: A retrospective observational study on the causes of increased orchidectomies in patients of epididymo-orchitis and testicular abscess was conducted in the department of General Surgery in GMC, KATHUA. Secondary data was collected from time period – January 2022- December 2022.**

**Results: We studied a total of 50 male patients aged between 20-55 suffering from epididymo- orchitis who had developed testicular ischemia and had to undergo inevitable orchidectomy.**

**Keywords: Testicular Abscess and Acute Epididymitis.**

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## INTRODUCTION

Acute epididymo-orchitis (the inflammation of one or both testes and epididymis) is a common urological diagnosis encountered by urologists and by emergency and primary care physicians. It should be differentiated from testicular torsion – a true urological emergency.

Furthermore, acute epididymitis can be complicated by testicular abscesses or by testicular infarction, due to spermatic cordswelling and by the impairment of blood flow (1)
These conditions can be subclassified as acute, subacute, or chronic based on symptom duration. In acute epididymitis, symptoms are present for less then six weeks and are characterized by pain and swelling. Chronic epididymitis is characterized by pain, generally without swelling, that persists for more than three months. Orchitis usually occurs when the inflammation from the epididymis spreads to the adjacent testicle.(2)
Epididymo-orchitis is a common cause of acute scrotal pain. One study reported concomitant orchitis in 58% of men diagnosed with epididymitis. Patients present complaining of testicular or scrotal pain and may have associated fever, fatigue, nausea, and vomiting. Infection is caused by retrograde ascent of pathogens to the epididymis and extends to the testis. The majority of infections are caused by bacteriaand occur in a bimodal distribution. In men aged 14 to 35 years, infection is commonly caused by sexually transmitted Neisseria gonorrhoeae or Chlamydia trachomatis. In men aged 35 years or older, common organisms are Escherichia coli, Klebsiella pneumoniae, Pseudomonas aeruginosa, and Staphylococcus and Streptococcus species. Rarely, the infectious process progresses to abscess formation with testicular infarction(3)
One of the mechanisms postulated to account for this critical deprivation is extrinsic compression of the testicular blood vessels caused by a tensely oedematous epididymis and, more importantly, by constrictive funiculitis secondary to inflammatory involvement of the cord itself. This has prompted some urologists to advocate early surgical decompression by means of epididymotomy and external spermatic fasciotomy in order to restore the blood flow4'. Though the reports of successful testicular salvage following this procedure are anecdotal, the concept is appealing.(4)Thrombosis during the course of epididymo-orchitis would seem to be the most likely explanation for these vascular lesions, as the interval of three to nine weeks between onset and orchidectomy would allow time for organization to take place. (5)In the setting of recurrent epididymo-orchitis, clinicians should be suspicious of a testicular abscess. This may not initially be evident on routine imaging, highlighting the value of additional modalities, such as MRI, when ultrasound evaluation proves to be inconclusive or inconsistent with the clinical presentation. These cases are a timely reminder about potential testicular loss following epididymo-orchitis, even if appropriate antibiotic therapy is administered.(6)
In the appropriate clinical setting gray scale ultrasonography provides objective information supporting the need for surgical intervention in selected patients with complicated epididymitis. Infarction is believed to occur due to spread of the inflammatory process to the spermatic cord resultingin compression of the testicular artery and decreased blood supply to the testis. Alternatively, development of a pyocoele may cause extrinsic compression of the venous outflow and marked edema, which ultimately leads to loss of arterial flow to the testis. Management of an infarct in the setting of infection requires scrotal exploration and orchiectomy in the majority of cases (7-8)Critical deprivation resulting in infarction is rare and may be secondary to cumulative ischemia from multiple mechanisms: inflammatory infiltration causing compression of the spermatic cord, thrombosis secondary to venous congestion and/or bacterial exotoxins. Prompt assessment and recognition of ischemia may lead to reperfusion interventions and ultimately testicular salvage.(9-10)Testicular abscess formation and ischemia are rare complications of epididymo-orchitis in the setting of appropriate antibiotic therapy While exact mechanisms remain unknown, proposed mechanisms suggest that compression of the vasculature of the epididymis and testicle effectively creates a compartment syndrome. Acute inflammatory changes, exudates, and tissue edema may result in extra luminal compression. Simultaneously, venous congestion

with resulting thrombosis and endothelial dysfunction increase pressure, leading to hypoxia. (11-12)

Testicular infections are usually treated with enteral or parenteral antibiotics, with little to no morbidity, it must be borne in mind that the progression to further complications can occur leading to greater morbidity and testicular loss.(13)In the setting of recurrent epididymo-orchitis, clinicians should be suspicious of a testicular abscess. This may not initially be evident on routine imaging, highlighting the value of additional modalities, such as MRI, when ultrasound evaluation proves to be inconclusive or inconsistent with the clinical presentation. These cases are a timely reminder about potential testicular loss following epidiymo-orchitis, even if appropriate antibiotic therapy is administered.(6)

**AIMS AND OBJECTIVES:**

AIM- to identify cause of increased orchidectomies in patients of both acute epididymo-orchitis andtesticular abscess

OBJECTIVE- Testicular abscess and acute epididimytis progressing to testicular ischaemia leading toinevitable orchidectomy: a retrospective study

RATIONALE:

It had been observed in recent months that patients in GMC, KATHUA with epididymo-orchitis and testicular abscess land up with testicular ischemia even after having undergone antibiotics treatment and therefore inevitable orchidectomy, with this study we intend to recognizesuch patients and identify cause of testicular ischemia.

**METHODOLOGY**

A retrospective observational study on the causes of increased orchidectomies in patients of epididymo-orchitis and testicular abscess was conducted in the department of General Surgery inGMC, KATHUA

Secondary data was collected from time period – January 2022- December 2022 .Secondary data to be collected included

- Pus culture and sensitivity reports (pre op and intra op)
- All baseline investigations including- CBC, LFT, RFT, PT INR, BLOOD SUGAR
- Histopathological report

The patients included in the study were decided according to the following criteria:

INCLUSION CRITERIA:

- Males of age 20-55
- Patients with epididymo-orchitis
- Patients with testicular abscess
- Patients with Doppler proved testicular ischemia
- Patients with diabetes

EXCLUSION CRITERIA:

- Patients undergoing orchidectomy due to undescended testis
- Patients undergoing orchidectomy due to testicular cancer
- Patients with testicular torsion

**RESULTS**

We studied a total of 50 male patients aged between 20-55 suffering from epididymo-orchitis who had developed testicular ischemia and had to undergo inevitable orchidectomy.

**ON PUS AND BLOOD CULTURE:**

- 27%of total patients showed Klebsiella on pus culture, 18% showed Klebsiella on blood culture, 9% showed Klebiella on both Blood and Pus culture.

- Of the total 54% of patients who grew Klebsiella, 60% were resistant to all amikacin, Aztreonam, Cefepime, Ceftazidime, Gentamycin, Imipenem, Levoflox, Meropenem, Netilmicin, Piperacillin+ Tazobactam.
- 17% were resistant to Amikacin, Aztreonam, Cefepime, Meropenem, Netilmicin, Piperacillin+ Tazobactam.
- 5% were resistant to Amikacin, Meropenem, Netilmicin, Piperacillin+ Tazobactam.
- 18% were resistant to Aztreonam, Cefepime, Meropenem, Netilmicin, Piperacillin+ Tazobactam.
- 5% of total patients showed pseudomonas in blood culture, 14% showed pseudomonas in pus culture, 2% showed pseudomonas in both pus and blood culture.

**Table 1**

| GROWTH CONTENT | BLOOD CULTURE | PUS CULTURE | BLOOD CULTURE + PUS CULTURE | TOTAL |
|---|---|---|---|---|
| KLEBSIELLA | 18 % | 27% | 9% | 54% |
| PSEUDOMONAS | 5% | 14% | 2% | 21% |
| NO GROWTH | 15% | 3% | 10% | 28% |

**CULTURE AND SENSITIVITY:**

KLEBSIELLA:

- Of the total 54% of patients who grew Klebsiella, 60% were resistant to all amikacin, Aztreonam, Cefepime, Ceftazidime, Gentamycin, Imipenem, Levoflox, Meropenem, Netilmicin, Piperacillin+ Tazobactam.
- 17% were resistant to Amikacin, Aztreonam, Cefepime, Meropenem, Netilmicin, Piperacillin+ Tazobactam.
- 5% were resistant to Amikacin, Meropenem, Netilmicin, Piperacillin+ Tazobactam.
- 18% were resistant to Aztreonam, Cefepime, Meropenem, Netilmicin, Piperacillin+ Tazobactam.

**PSEUDOMONAS:**

- Of the total 21% of patients who grew pseudomonas, 80% were resistant to all amikacin, Aztreonam, Cefepime, Ceftazidime, Gentamycin, Imipenem, Levoflox, Meropenem, Netilmicin, Piperacillin+ Tazobactam.
- 9% were resistant to Amikacin, Aztreonam, Cefepime, Meropenem, Netilmicin, Piperacillin+ Tazobactam.
- 4% were resistant to Amikacin, Meropenem, Netilmicin, Piperacillin+ Tazobactam.
- 7% were resistant to Aztreonam, Cefepime, Meropenem, Netilmicin, Piperacillin+ Tazobactam.

**BASELINE INVESTIGATIONS:**

- 27% of the patients were known cases of T2DM aged between 40-55.
- TLC was raised in 79% of the patients.

**ON HISTOPATHOLOGY:**

- Histopathological report of patients were also collected which showed
- 100% of patients had dead testicular tissue
- out of which 43% showed pressure necrosis probably caused due to compartment syndrome caused by unresolved recurrent epididymoorchitis.

- 35% showed increased neutrophilic and interleukin collection in and around the testicular tissue.
- 22% showed testicular vessels compromise due to narrowing caused by increased inflammatory cells.

**Table 2**

| PRESSURE NECROSIS | NEUTROPHIL INFILTERATION IN TESTICULAR TISSUE | TESTICULAR VESSEL COMPROMISE |
|---|---|---|
| 43% | 35% | 22% |

## DISCUSSION

The above results tell us that multi drug resistant Klebsiella might be responsible for the development of testicular ischemia leading to orchidectomy in these patients residing in kathua.

The increase In prevalence of this organism has increased the failure rate of treatment of epididymo-orchitis that ultimately led to testicular ischaemia and further inevitable orchidectomy.

The mechanism that led to such a condition could be attributed mostly to the formation of compartment syndrome that is basically increased pressure in the scrotal region that increases pressure to the testis leading to pressure necrosis and death of the tissue. The pressure necrosis occurs due to increased inflammatory markers and interleukins which blocks the lymph channels as well as produce inflammatory fluid that due to resistance to treatment keeps on increasing and devitalizes the testis, sometimes this fluid collection is superinfected by bacteria causing testicular abscess which if left untreated causes the testis to die and with the drainage of pus orchidectomy has to be done.

Some patients who had to undergo orchidectomy were suffering from diabetes mellitus especially patients in 3$^{rd}$ decade of life, with uncontrolled diabetes an immunocompromised state sets in the body that hinders the body's ability to fight off even minor infections and when they suffer from epididymo-orchitis without sugar control the infection stays untreated and due to decreased pain sensation, patient presents to the hospital late and the time period of testicular salvage has gone by then.

Pseudomonal infection found in some patients could be attributed to the fact that their frequent visits to the hospital and immunocompromised states led them to acquire the hospital acquired pseudomonal infection which was resistant to most of the drugs available and failure of treatment led to abscess formation and then further led to orchidectomy.

The conclusion of this study comes out to be increased incidence and prevalence of klebsiella infection in Kathua district of J&K, that is resistant to standard drugs used for epididymo-orchitis causing increased treatment failure rate, compartment syndrome formation, recurrent epididymo-orchitis due to non resolving infection and finally inevitable orchidectomies

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