

## CASE REPORT

# Surgical Management of Omphalitis and Post-puberty Unilateral Undescended Testis: A Case Report

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Chandran K.R., Meghani Y.R., Joshi P.B. Surgical Management of Omphalitis and Post-puberty Unilateral Undescended Testis: A Case Report. Ind J Anct Med Yoga. 2025; 18(1): 37–43.

**ABSTRACT**

Omphalitis, an infection or inflammation of the umbilicus, predominantly affects infants but can also occur in adults, often linked to poor hygiene or anatomical abnormalities such as urachal remnants. The condition is commonly caused by bacteria, with *Staphylococcus* species accounting for over 50% of cases. Symptoms typically include umbilical pain, erythema, tenderness, and discharge, which may worsen into complications like abdominal abscess or umbilical granuloma if left untreated. The case report discusses a 32-year-old male presenting with umbilical pain, burning, and purulent discharge, diagnosed with omphalitis likely stemming from a previous trauma. His condition was managed initially with antibiotics and subsequently with omphalectomy to prevent recurrence. During the examination, undescended left testis was also noted and managed through orchidectomy due to the risk of malignancy. Postoperative recovery was uneventful, with complete healing and no recurrence after two years. Omphalitis treatment includes a combination of antibiotics for acute infection and surgical intervention if required. Ayurvedic medicine addresses similar inflammatory conditions as *Abhigataja Sopha*, recommending both medicinal and surgical methods to alleviate symptoms and prevent complications. This case emphasizes the importance of prompt surgical intervention in cases of persistent omphalitis, particularly when anatomical anomalies such as undescended testis are also involved. Regular follow-up is crucial to monitor healing and prevent recurrence or further complications.

**KEYWORDS**

• *Abhigataja Sopha* • Omphalitis • Undescended testis • Vrana Sopha

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Received: 27-12-2024

Revised: 15-01-2025

Accepted: 19-01-2025



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## INTRODUCTION

**Omphalitis:** The infection or inflammation of umbilicus is known as Omphalitis. It is most common in infant population. The most common causative organisms are Staphylococcus (in more than 50% of cases) and less commonly caused by Streptococci, Escherichia coli and even Clostridium tetani. Omphalitis in adults is not uncommon. It is associated with poor hygiene and deeply placed umbilicus in obese individuals. The most common cause of umbilical discharge in adults are due to acquired conditions such as hair tufts with infection, pilonidal sinus and foreign bodies. Embryonal anomalies, such as patent urachus/vitelline duct, urachal cyst or sinus, vitelline cyst or sinus may present as umbilical discharge. The patient complains of umbilical discharge which is seropurulent with unpleasant smell. Pain is very common symptom. On examination one may find red and tender umbilicus. Complications: Abscess of abdominal wall, Septicaemia, Portal vein thrombosis, Jaundice, extensive ulceration of abdominal wall and umbilical granuloma. Chronic umbilical inflammation unresponsive to usual therapy for omphalitis results in Umbilical granuloma.<sup>1</sup> Prevalence: Omphalitis has a significantly higher incidence in developing countries, affecting 8% of hospital-born and 22% of home-born infants, compared to 0.7% in developed countries.<sup>2</sup> Treatment: First line of treatment starts with antibiotics and application of silver nitrate and dry dressing. Second line of treatment includes surgical excision or umbilectomy after resolution of infection. When the descent of testis is arrested somewhere in its normal pathway to the scrotum, undescended testis occurs.

The central point of body in between *Amashaya* and *Pakvashaya* is termed as *Nabhi* (umbilicus).<sup>3</sup> It is considered as *Marma* (vital spot).<sup>4</sup> In *Susruta Samhita*, *Nabhi* is mentioned as the origin place of *Sira* and *Dhamani*.<sup>5,6</sup> Being as one of the *Marma* and origin place of *Sira* and *Dhamani* any kind of injury can lead to sudden death of the person.

## CASE SUMMARY

A 32-year-old male patient who reported to Shalya Tantra OPD of ITRA Hospital, Jamnagar with the complaints of pain and burning sensation in umbilical region for 10

days. According to patient, he was apparently well 10 days back, after an alleged injury he gradually developed pain in umbilical region burning in nature. The pain was gradual in onset, non-radiating in nature, persisting all day long. Pain in umbilical region was associated with pus discharge from umbilicus. Patient had no history of fever. Pain was more severe during night. Patient had taken some oral analgesics but didn't get any relief. Patient had no relevant past history and any significant family history. His appetite was good with normal bowel and bladder habit. Patient's sleep was adequate with 6-7 hours of sleep per night. Patient had habit of chewing tobacco for 10 years.

## DIAGNOSTIC CRITERIA

On abdominal examination, pus discharge with some what everted granulomatous changes in the umbilicus was seen with normal surrounding skin (Shown in Figure 1 and 2). Mild tenderness on palpation. On inguino-scrotal examination, absence of testis on left side scrotum was discovered. There was no swelling on inguino-scrotal region, skin was normal. No tenderness and raised temperature on palpation.



**Figure 1:** Active pus discharge, redness and granulomatous changes in the umbilicus



**Figure 2:** pre-operative photo

### **USG ABDOMEN-PELVIS**

**LIVER** Normal size and shows normal echotexture. No evidence of focal lesion. Intrahepatic biliary radicals are not dilated. Common bile duct and Portal vein appears normal. Hepatic veins show no evident abnormal dilatation.

**GALL BLADDER** Distended and appear normal. No evidence of gall stone. Wall thickness is within normal limits.

**PANCREAS** undervision appears normal in size and echotexture. No evident peripancreatic collection.

**SPLEEN** Normal size and shows normal echotexture.

**KIDNEYS:** Both kidneys are normal in size, shape and echotexture. CM differentiation is preserved on either side. No evidence of renal stone or hydronephrosis on either side.

Right kidney: 104 x 37 mm. Left kidney: 100 x 46 mm.

**URINARY BLADDER** Distended and appears normal. No e/o stone or mass.

**PROSTATE** Normal size and shows normal echotexture.

Bowel loops undervision reveal no evident abnormal dilatation.

No evidence of free fluid in peritoneal cavity at present.

RIF is unremarkable. No evidence of collection or lump.

Para-aortic axis is unremarkable.

**IMPRESSION:** No significant sonological abnormality is detected. Mild diffuse circumferential inflammatory wall thickening of umbilicus is noted, maximum wall thickness 5.5 mm. No evidence of well defined pockets of abscess. No evident internal communication with peritoneal cavity. P/o umbilical infection is likely.

Figure 3: USG of Abdomen and pelvis

### **USG OF INGUINOSCROTAL REGION**

#### **BILATERAL INGUINAL REGION.**

No evidence of inguinal hernia on either side.

No evidence of any significant lymphadenopathy.

**Left testis** not seen in left scrotal sac. Left testis is noted in lower most abdomen anterior to left iliac vessels and left lateral to distended urinary bladder. Left testis is 25 x 12 mm. Left testis is small in size and shows normal echotexture.

#### **RIGHT TESTES:**

Right Testis: 45 x 22 mm.

Right testis is normal in size and echo pattern.

No evidence of solid or cystic lesion.

Normal vascularity is seen on colour doppler examination.

#### **RIGHT EPIDIDYMIS:**

Right epididymis appear normal in size, shape & echotexture.

No evidence of abnormal hypervascularity noted on colour doppler examination.

No evidence of varicocele on right side.

No evidence of fluid collection noted in right TV sac.

**IMPRESSION:** Undescended left testis, located in lowermost abdomen anterior to left iliac vessels and left lateral to urinary bladder.

Figure 4: USG of Inguinoscrotal region

On Ultrasonography of abdomen and pelvis, impression showed no significant abnormality. Mild diffuse circumferential inflammatory wall thickening of umbilicus was noted maximum wall thickness of 5.5 mm, no evidence of well-defined pocket of abscess, no evident internal communication with peritoneal cavity. Post traumatic umbilical infection likely. Impression on Ultrasonography of inguinoscrotal region showed undescended left testis, located in the lower most abdomen, anterior to left iliac vessels and left lateral to urinary bladder (Shown in Figure 4). The patient was admitted to Shalya Tantra IPD, surgical male ward, ITRA Hospital, Jamnagar with a plan for omphalectomy and orchidectomy. All relevant investigations i.e., haematology, biochemistry, serology, chest x-ray, ECG etc were carried out. After obtaining all report within normal range, informed written consent from patient and explaining him and his attendants about probable consequences, surgery was carried out.

## METHODOLOGY

**Pre-Operative Procedure:** Patient was kept NBM from 6-7 hours prior to surgery. Part preparation was done. Tetanus toxoid injection 0.5ml was given intramuscularly. After insertion of intravenous cannula, Xylocaine sensitivity test was done by injecting Xylocaine 2% 0.1ml intradermally. Intravenously, Injection Cefotaxime and Sulbactam 1500mg/10ml and Injection Ranitidine 50mg/2ml was given 45 minutes prior to operation.

**Operative Procedure:** Patient was taken to operation theatre with stable vitals. Under all aseptic precautions, spinal anaesthesia was given in sitting position followed by supine position. IV RL 1000ml was given during procedure. Painting was done with betadine solution 10% followed by draping with sterile cut sheet. Elliptical incision was given around umbilicus with 15 no. blade and it was held with Alli's tissue forceps followed by layer-by-layer dissection with monopolar electrocautery (shown in figure 5). Skin-subcutaneous fat-Camper's Fascia-Scarpa's Fascia-Rectus Sheath-Rectus abdominis muscle. After exploring Rectus abdominis, infection was suspected to be spread beneath. Small incision was given in parietal peritoneum to check further extension of infection and any defect which was found to be normal (shown in figure 6). Umbilicus was excised completely

(shown in figure 7) followed by closure of rectus abdominis with Ethilon-1. Wash was done with diluted betadine solution with NS. Closure of subcutaneous tissue was done with Vicryl 2-0 interrupted suture followed by incomplete closure of skin with Ethilon 3-0 interrupted suture for checking the infection and late closure of skin by suturing, after obtaining healthy wound condition (wound healing by tertiary intention).



Figure 5: Elliptical incision around umbilicus



Figure 6: parietal peritoneum to check further extension of infection and any defect which was found to be normal

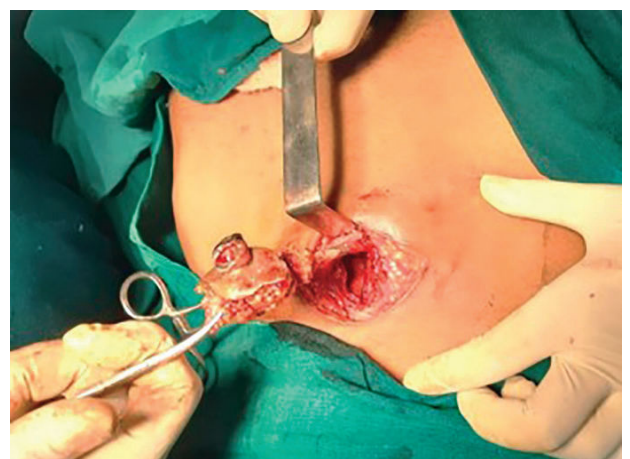


Figure 7: Complete excision of umbilicus

Linear incision was given with 15 no. blade at mid inguinal line from medial 2/3<sup>rd</sup> of Pubic tubercle followed by layer-by-layer dissection with monopolar electro-cautery. Skin-subcutaneous fat-Camper's Fascia-Scarpa's Fascia-external oblique aponeurosis. Surgical field was explored with the help of retractor. Ilioinguinal nerve which came in between was isolated, vessels were cauterized. Eversion of gubernaculum was noticed from deep ring which was followed to take out testis along with spermatic cord from its normal path of descend. Inguinal canal was checked for any kind of defect or herniations (*shown in figure 8*). Undescended component was reached up to root and transfixed with Vicryl 3-0 followed by complete excision with monopolar cautery. The sac was closed with Vicryl 3-0 followed by closure of external oblique aponeurosis with Prolene 2-0 continuous interlocking suture and subcutaneous tissue with Vicryl 3-0 interrupted suture. Closure of skin was done with Ethilon 3-0 by vertical mattress suture. Wound was closed with dry gauze and dynaplast. Patient was shifted to ward with stable vitals.



Figure 8: Undescended testis

Testis along with gubernaculum and excised umbilicus was sent for histopathological investigation. The histopathological finding was, section of specimen showing atrophic testis with seminiferous tubules lined by Sertoli cells only with complete absence of germ cells. Few tubules lined by immature Sertoli cells. Interstitial cells of Leydig are unremarkable. No evidence of Intratubular germ cell neoplasia/malignancy seen. Specimen of umbilicus showed acute on chronic inflammation with abscess formation. No evidence of granulomatous lesion or

malignancy seen in submitted biopsy.

**Post-Operative:** Headlow position was given. Injection Gentamycin 2 ml 8 hourly, two doses, Injection Diclofenac 8 hrly, Injection Ranitidine 2 ml 12 hrly, Injection Cefotaxime and Sulbactam 1500 mg 12 hrly was given. Cap Pantocid DSR was given before breaking NBM. IV DNS 1000 ml was given post operatively. From next day Tab Cefdinir 300 mg twice days for 5 days, Tab Zerodol SP twice daily for 5 days, Cap Pantocid DSR once daily for 5 days, Tab Becozyme-c-forte once daily for 10 days. Daily dressing was done. There was no sign of infection. Suture was removed on 7<sup>th</sup> day and wound was healed completely within 20 days by secondary intention.

**Follow-Up and Outcome:** Patient got complete relief from pain, burning sensation and pus discharge from umbilical region within 20 days (*shown in Figure 8 & 9*). Follow up was taken up to 2 years. There was no any recurrence or complications found in follow up period up-to 2 years.



Figure 9: Post-operative day 5



Figure 10: Post-operative day 15

## DISCUSSION

Omphalitis is the inflammation and infection of umbilicus. Mainly occurs in infants. In adults it can be caused due to urachal remnant, vitelline duct, and inadequate hygiene, hair tufts with infection, pilonidal sinus and foreign bodies. It can even encounter during elective surgery and may complicate the insertion of a laparoscope port at the umbilicus. The most common infectious agents are Staphylococci, Streptococci, Gram negative organisms.<sup>7</sup> A comprehensive understanding of the anatomy of umbilicus and its anatomical relationships with surrounding structures is crucial in determining the signs and symptoms of omphalitis. Preperitoneal pyramidal fascial space called as Retziu's space which extends from dome of bladder to umbilicus prevents infection involving umbilicus to remain confined as midline infraumbilical abscess with no signs of peritonitis.<sup>8</sup> Erythema, oedema and tenderness to palpation are the usual signs of omphalitis but if it is associated with fever, lethargy and decreased oral intake systemic involvement should suspect.<sup>9</sup> The presented patient had pain, burning sensation and pus discharge from umbilical region, and had no history of fever, and lethargy and oral intake was normal indicating omphalitis without systemic involvement. The management of omphalitis includes two stages. The acute infection should be managed with appropriate antibiotics and later surgical excision of umbilicus should perform to prevent various complications include abdominal wall abscess, extensive abdominal wall ulceration, recurrence, or a carcinoma.<sup>10</sup> This patient was on amoxycillin & potassium clavulanate 625mg for a period of 5 days showing clinical improvement.

The testis develops in the retroperitoneum at the posterior abdominal wall from genital tubercles and is led to the scrotum by the gubernaculum. By the 7th month, it reaches the deep inguinal ring, then the inguinal canal, and finally the superficial inguinal pouch. The testis often reaches the scrotum at full maturity. Complications include trauma producing pain, Epididymo-orchitis, Sterility, Torsion, Indirect hernia in majority of cases, Seminoma of testis and other testicular malignancies. The treatment of choice is orchidectomy after the age of 14 because of malignant potential.<sup>11</sup>

In Ayurveda, inflammation is described in various contexts such as *Vrana Sopha* (Inflammatory swelling) and *Abhigataja Sopha* (traumatic swelling). *Vrana Sopha* has 3 stages i.e. *Amawastha* (The early stage of inflammation), *Pachyamanawastha* (The true inflammatory stage) and *Pakwawastha* (The suppurative stage).

In this case, *Abhigata* (trauma) initiated *Dosa* vitiation which in turn vitiates the *Rakta Dhatu* which travels through the *Srotas* (micro channels) and localised in the area of trauma causing *Kha Vaigunya* (relatively weakened structure). Vitiated *Vata* will cause pain and vitiated *Kapha* will cause swelling and discharge and due to association of vitiated *Rakta/Pitta* cause redness. The vitiated *Rakta* along with other vitiated *Dosas* produce *Paka* (pus formation) of *Sopha* and will form into *Vrana*.<sup>12</sup> According to Acharya Susruta, all the *Asta Vrana Vastu* i.e. *Twak, Mamsa, Sira, Snayu, Asthi, Sandhi, Kosta* and *Marma* are involved in the formation of *Sopha*.<sup>13</sup> If *Sopha* do not resolve it leads to the destruction of *Mamsa Dhatu* along vitiated *Dosas* will contribute towards the manifestation of *Vrana*. *Vrana Lakshanas* include *Daha* (burning sensation), *Paka* (formation of pus), *Raga* (redness), *Vedhana* (Pain), *Puyasrava* (Pus discharge).<sup>14</sup>

Acharya Sushruta has mentioned *Saptopakram* for the management of *Vrana Sopha*. This *Saptopakram* is a set of seven procedures (i.e. *Vimlapan, Avsechna, Upnaha, Patankriya, Shodhan, Ropan* and *Vaikrutapaham*) for managing *VranaShopha* at each of its stages. *Shasti Upakramas* (60 procedures) are told by Acharya Sushruta for the management of *Vrana*. In which *Pidana* (compression) and *Eshana* (probing) *Upakramas* were performed for local examination followed by *chedana* (excision), *Bhedana* (incision), *Daarana* (splitting/tearing), *Lekhana* (scraping), *Aharana* (extraction), *Vyadhana* (puncturing), *Visravana* (Squeezing out), *Seevana* (suturing), *Sandhana* (unification) *Sonitasthapana* (enabling proper circulation/checking the bleeding), and *Agnikarma* (fire cauterization).<sup>15</sup> Hence *Nabhi* (umbilicus) is a vital spot, *Paka* (formation of pus) of this area requires immediate surgical management.

## CONCLUSION

Omphalitis, an infection of the umbilicus, occur in adults due to factors like urachal remnants,

poor hygiene, or surgery, commonly caused by bacteria such as Staphylococci. Symptoms are typically localized to the umbilical area due to Retzius' space but may spread if systemic signs like fever appear. Management starts with antibiotics, and surgical excision is considered for recurrent cases to prevent complications. Ayurveda addresses similar infections as *Abhigataja Sopha*, with treatments including surgical interventions to manage inflammation and pus at the umbilicus.

**Consent of Patient:** Consent was taken from the patient before starting the treatment protocol as well as prior to publication of the case details and pictures.

## ACKNOWLEDGEMENTS

**Prof. (Dr.) B.J. Patgiri**, Director Sir, Institute of Teaching and Research in Ayurveda and Prof. (Dr.) T.S. Dudhamal HOD Shalya Tantra, Institute of Teaching and Research in Ayurveda for providing all facilities in the department to conduct research.

**Conflict of Interest:** Nil

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