Infections presenting in the space of Retzius are historically attributed to bladder infections, urological infections, osteomyelitis of the pubic symphysis, or granulomatous disease. Increasingly, surgeons are entering this space for procedures such as prostatectomies, orthopaedic manipulation of the pelvis, and laparoscopic inguinal hernia repairs.

As with other extraperitoneal infections, patients typically present with vague and nonspecific complaints. These patients often lack physical examination findings, creating a diagnostic dilemma and potentially delaying definitive treatment. Additionally, the complex extraperitoneal anatomic planes allow extension of disease from distant sites. We present a previously unreported space of Retzius infection arising from a perirectal abscess, along with anatomic review and summary of the literature.

Case Description
A 49-year-old man with no past medical history presented to an outside hospital complaining of perirectal and abdominal pain. The patient’s white count was 19 000 with a bandemia of 58%. A computer tomography (CT) scan revealed proctitis and a perirectal fluid collection. He was placed on broad-spectrum antibiotics, and the perirectal abscess was incised and drained, and a Penrose drain was placed. Secondary to worsening sepsis, the patient was transferred to our academic tertiary referral center for further workup, approximately 36 hours after initial presentation. The patient appeared uncomfortable with tachypnea and fever, but was otherwise hemodynamically stable. His
exam was nonspecific with vague, diffuse, abdominal tenderness. He had normal bowel sounds, normal urinalysis, and no masses palpated on rectal exam. Bowel function was reportedly normal. The Penrose drain placed by the referring hospital was intact, and the incision and drainage appeared open. After review of the patient’s original CT scan, the decision was made to re-examine the patient in the operating room with a proctoscope to evaluate for any undrained collections, with the concern being there was an area of multi-loculated abscess that was not fully drained. The abscess cavity appeared to be adequately drained and no other pathology was noted.

In the setting of continued sepsis with an unidentified source, a repeat CT scan was performed (Figs. 1 and 2). This revealed bilateral pneumonia and an extraperitoneal fluid collection that extended from retroperitoneum anteriorly to the space of Retzius, and superiorly to the umbilicus without intraperitoneal involvement. Air within the fluid collection, as well as the patient’s clinical condition, was indicative of an undrained abscess. Figure 3 is a diagram showing the extent of the abscess and can be compared with Figure 2. The patient was taken to the operating room where a lower midline incision was used to gain access into the retroperitoneal compartment. A large abscess was evacuated that extended from the pelvic presacral space into the retroperitoneum abutting the spine, creating a free-floating peritoneum. The peritoneum remained intact and no intraperitoneal structures were involved. Separate incisions placed in laterally dependent areas in the patient’s flanks allowed for adequate drainage and wound care using negative pressure wound therapy (NPWT). Wound cultures revealed Escheridia coli, Bacteroides thetaiotamicron, and Clostridium species. With serial washouts of this space, NPWT, and broad-spectrum antibiotic therapy, the patient went on to recover completely over the next several months with no long-term complications.

Discussion
This rare extension of distant infection to the space of Retzius highlights the complex anatomic planes that make up the retroperitoneal and extraperitoneal compartments. Anders Retzius initially defined the prevesical space in 1856 at a report presented to the Academy of Stockholm with subsequent description of the first described infection in the area by Wenzel Gruber in 1862. Familiarity with this anatomy and the potential interconnecting spaces is critical for early recognition and treatment of such complex infections as presented here. The anterior extraperitoneal space is created by 1 central and 2 paired folds of peritoneum extending from the umbilicus known as the median, medial, and lateral umbilical ligaments. The lateral umbilical ligaments are formed by the inferior epigastric vessels. The medial umbilical ligaments are formed by the remnants of the obliterated umbilical arteries. The centrally located median umbilical ligament is a peritoneum-covered ridge formed by the obliterated urachus, connecting the umbilicus to the anterior dome of the bladder. Surrounding the median umbilical ligament (urachus) and extending laterally to the medial umbilical ligaments is the umbilicovesical fascia. It is the combination of these folds and ligaments that forms the pathognomonic “molar tooth” outline of abscesses seen on CT. Inferiorly, the umbilicovesical fascia is contiguous with the visceral fascia of the bladder. Anteriorly, the umbilicovesical fascia is the umbilical-prevesical fascia, and it extends from the umbilicus to the inferolateral surface of the bladder. The space between the umbilicovesical fascia and the umbilical-prevesical fascia at the level of the pubis is known as the retropubic space of Retzius. This space normally contains fat, loose fibrous tissue, and a perivesical venous plexus. Laterally, this extends to the space of Bogros, which lies below the inguinal ligament and contains the iliofemoral vessels medially and the iliopsoas muscle more laterally. Continuing posterolaterally, this is directly contiguous with the infrarenal retroperitoneal compartments, and caudally extends to the suprapelvic extraperitoneal space, potentially allowing direct spread of infection between these spaces. In

![Figure 2](image1)

*Sagittal CT scan showing extent of abscess from perirectal area to umbilicus. Area of interest outlined.*

![Figure 3](image2)

*Diagram of abscess. A = Abscess, B = Bladder, C = Rectum.*
our patient’s case, the original perirectal abscess most likely extended cephalad through the supravelvator space, continued into the iliac space, and then progressed in a lateral-to-medial direction into the prevesical space. Chen et al4 and Auh et al5 have demonstrated that there is a direct communication from pararectal space to the vesicle extraperitoneal space without a separating fascial layer due to the umbilicovesical fascia ending at the reflection of the vesical peritoneum. From the prevesical space, the infection was able to spread through the entire space of Retzius anteriorly, as well as into other pelvic compartments, and the retroperitoneum posteriorly, through direct spread.

Space of Retzius infection, as with other extraperitoneal infections, is insidious and difficult to diagnose secondary to the absence of physical signs. Patients can have vague and nonspecific complaints, with urinary frequency and urgency signs. Patients can have vague and nonspecific to diagnose secondary to the absence of physical peritoneal infections, is insidious and difficult.

Management of complex extraperitoneal abscesses has been extensively discussed in the literature, with percutaneous approaches being the favored method as opposed to open surgical approaches.6-11 With increasing surgical manipulation of these planes, the general surgeon must be familiar with their potential interconnections when considering both source and intervention. Transperitoneal drainage should be avoided, as this leads to high rates of recurrence and increases mortality.8

Conclusion

Though a rare presentation, this case highlights the complex anatomic compartments and potential spaces that exist in the extraperitoneum that allowed a common, typically benign perirectal abscess to extend to the supravelvator space, and eventually to the space of Retzius. In the absence of rapid clinical improvement after initial drainage, the clinician must have a high index of suspicion for more complex disease and seek additional workup and treatment. Computed tomography scanning is probably the best tool for evaluation, as the clinical presentation of extraperitoneal abscesses is more insidious and can have little to no physical exam signs with non-specific laboratory studies. Early consideration and identification of extraperitoneal abscesses is crucial for timely intervention in a patient’s care, as delays in diagnosis and treatment carry significantly higher morbidity and mortality.

References