Case Report	
	
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Title	**When common pathogens take uncommon paths: Streptococcus in a pediatric pelvic abscess**
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Keywords	**Abstract**
Abdominal abscess Pelvic abscess Paediatric Streptococcus SAG **Abbreviations** *Streptococcus anginosus group* (SAG)	Abdominal abscesses are commonly associated with gastrointestinal perforations, appendicitis or post-traumatic intra-abdominal infections and pelvic abscesses are commonly seen in females due to genitourinary pathology. Streptococcus species, particularly those from the Streptococcus anginosus group (SAG), are known to be abscess-forming pathogens. We present a case of a 15 year-old male with a pelvic abscess, likely secondary to an occult bowel trauma or appendicular pathology, in which Streptococcus

MRSA – Methicillin Resistant Staphylococcus aureus MRI – Magnetic resonance imaging USG – Ultrasound CECT – Contrast enhanced Computed Tomography	was identified as the causative organism.

Pelvic abscesses are usually polymicrobial with common pathogens including Escherichia coli, Bacteroides species, and Streptococcus species. While appendicitis and gastrointestinal perforation are typical causes, post-traumatic intra-abdominal abscesses are rare. The Streptococcus anginosus group (S. intermedius, S. constellatus, S. anginosus) are particularly known for their abscess-forming potential. This case highlights a unique presentation of a streptococcal abdominal abscess in a paediatric patient with a history of blunt abdominal trauma, raising questions about the role of trauma in its etiopathogenesis.

Case report

15 year old boy presented with lower abdominal pain, bilious vomiting and low grade fever since 4 days. On detailed history the child disclosed that he had a history of trauma (fall from bicycle) two weeks prior to the onset of symptoms. Clinical examination revealed a vague suprapubic mass with guarding and tenderness. On rectal examination, a tender boggy swelling was felt anterior to the rectum. (Figure.1)

Imaging studies with ultrasound (USG) and CECT Abdomen & Pelvis showed inflammatory changes with fat stranding in the right iliac fossa with a large collection in the rectovesical pouch. (Figure. 2) Though no definitive bowel perforation was seen, a sealed off perforation was suspected due to history of trauma.

We proceeded with Laparoscopy. Intraoperative findings revealed multiple adhesions of the bowel and omentum to the anterior abdominal wall. A large encapsulated pelvis abscess was noted. Pus was aspirated and sent for culture following which the abscess was drained. Nearly 500 ml of thick pus was drained. (Figure. 3 and Fig.4). The appendix was not visualised and there was no evidence of perforation in the visualised bowel loops. We avoided doing a complete bowel inspection due to dense adhesions and the risk of causing iatrogenic bowel injury. Abdominal drains were inserted in the abscess cavity and the pelvis behind the cavity prior to closing the laparoscopic ports.

Postoperative period was uneventful. Child was started on empiric IV amoxicillin-clavulanic acid perioperatively as per departmental protocol. Intraoperative pus

cultures report obtained by 48 hours showed Streptococcus species with Penicillin and Ampicillin recommended as drugs of choice but as the child was already improving on empiric antibiotic, the same was continued for 2 more days (total 5 days of antibiotic therapy) and stopped. Child was started on oral diet and oral antibiotic after 48 hours. Abdominal drains had minimal serosanguinous discharge and they were removed on postoperative day 7. At the time of discharge child was afebrile and was tolerating normal diet well with normal bowel movements. At 6 months follow up, the child is asymptomatic and doing well.

Observations

Fig.1: On abdominal palpation a 15 x 10 cm

mass in the suprapubic region

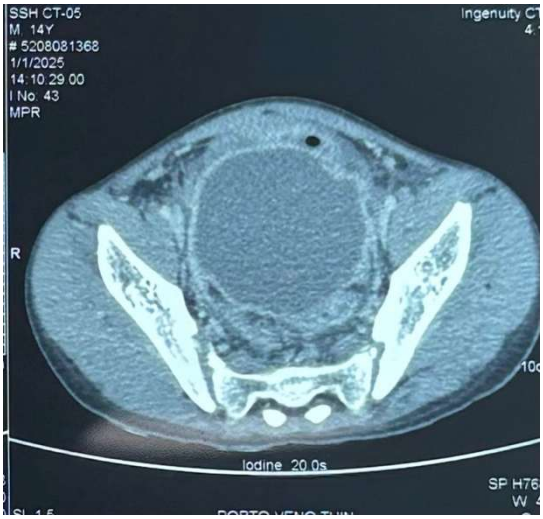

Fig. 2: CECT Abdomen & Pelvis: 7.8x8.2 cm well defined thick peripherally enhancing hypodense collection with air foci in the rectovesical pouch

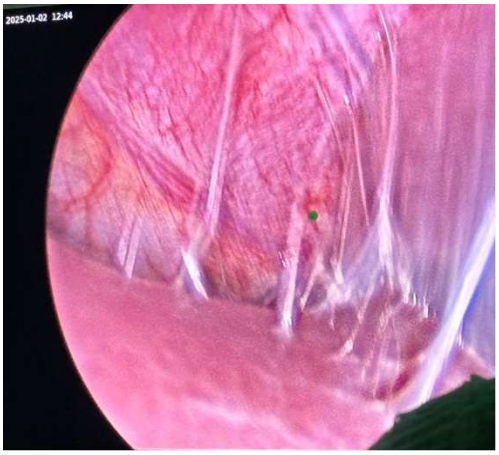

Fig. 3: Multiple adhesions noted to anterior abdominal wall on laparoscopy

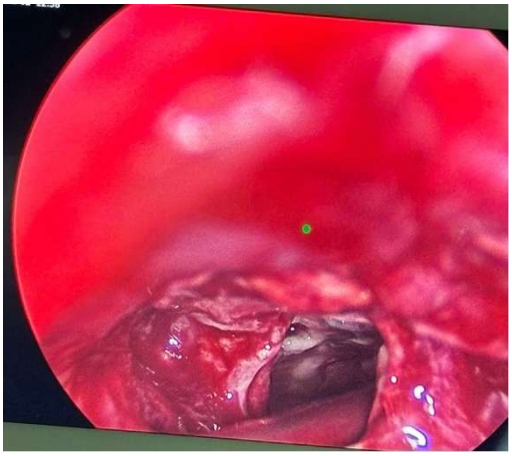

Fig.4: Abscess cavity in the pelvis posterior to the bladder and dense adhesions of the abscess to the abdominal wall

Discussion

Abdominal abscesses in paediatric populations are serious infections typically arising from perforated appendicitis, inflammatory bowel disease (IBD), postoperative complications or hematogenous spread. They are often polymicrobial, requiring broad-spectrum antibiotic coverage and sometimes surgical drainage. While *Escherichia coli* and *Bacteroides fragilis* are among the most commonly implicated organisms, increasing attention has been paid to less commonly implicated pathogens like *Streptococcus* species. Understanding the range of causative organisms is essential for effective clinical management, especially in children whose immune responses and anatomy differ from adults.

Escherichia coli is the most frequently isolated aerobic Gram-negative rod in paediatric abdominal abscesses. It originates from gut flora, especially in cases of gastrointestinal perforation or appendiceal rupture. A 2021 study by Smith et al. found *E. coli* present in over 70% of cultured abscesses in 45 paediatric patients [1].

Anaerobes such as *Bacteroides fragilis*, *Peptostreptococcus* spp., and *Clostridium* spp. are common in intra-abdominal infections. These organisms

thrive in oxygen-deprived environments like the peritoneal cavity and contribute to abscess formation through synergistic interactions with aerobes. Less commonly encountered organisms are *Enterococcus faecalis* and *Enterococcus faecium* are frequently isolated from polymicrobial abdominal abscesses. *Staphylococcus aureus* (including MRSA) is less common but noted particularly in post-surgical or hematogenous seeding.

Though not traditionally dominant, *Streptococcus* species, especially those in the *Streptococcus anginosus group* (SAG), are increasingly recognized as potent pathogens in abdominal and pelvic abscesses. Thomas et al. in 2019 identified SAG bacteria in 30% of 30 paediatric abdominal abscess cases, often alongside *E. coli* [2]. These organisms are part of the normal flora of the oropharynx and gastrointestinal tract but can cause invasive infections when translocated. This underscores the importance of considering a broad range of pathogens in the differential diagnosis of pelvic abscesses in children.

Streptococcus is known to spread through the blood stream and seed in the pelvic area. In adolescent females the vaginal flora (which may include *Streptococcus agalactiae*, or GBS) can ascend and contribute to pelvic infection. A retrospective study by Lee et al. reviewed 12 cases of tubo-ovarian abscesses in adolescent females, highlighting that while *Escherichia coli* was the most frequently isolated organism, *Streptococcus agalactiae* (Group B Streptococcus) was also identified in some cases, particularly in sexually active adolescents [3]. In children with neutropenia**,** malignancy or on immunosuppressive therapy, *Streptococcus* species—typically kept in check by the immune system—can cause invasive infections including abscesses. The spectrum of conditions that wherein Streptococcus species have been isolated have been summarised. (Table 1)

Table. 1 Spectrum of conditions that wherein Streptococcus species have been isolated

Source	Likely Streptococcus Species	Common Scenarios
GI tract (appendicitis)	*S. anginosus* group	Ruptured appendix, IBD, perforation
Bloodstream	*S. pyogenes*, *GBS*	Bacteremia, neonatal sepsis
Vaginal/Gynecologic	*GBS*, *S. anginosus* group	PID, tubo-ovarian abscess in adolescents
Post-surgical	*S. pyogenes*, *SAG*, *GBS*	Abdominal surgery complications
Immunocompromised	Any, especially *SAG*	Chemotherapy, transplant, chronic disease

Our case aligns with findings from Johansson et al. [4], who described Streptococcus anginosus group (SAG) as major pathogens in deep-seated infections, including intra-abdominal and pelvic abscesses. The presence of Streptococcus in our case further supports their role in intra-abdominal infections. Unlike the common appendicitis-related abscesses, our case was preceded by minor abdominal trauma, raising suspicion of a sealed-off injury suggesting either a micro-perforation or

hematogenous spread of Streptococcus species leading to abscess formation. The importance of considering post-traumatic infections in paediatric patients, even after minor injuries is vital as very often, these injuries are not witnessed by adults and the child may underestimate the severity or not disclose the severity due to fear of punishment. Wong et al [5] described emerging recognition of Streptococcus species in intra-abdominal abscesses, particularly in immunocompromised individuals. However, our case highlights that even healthy paediatric patients can develop severe infections from these bacteria.

Solomkin et al. [6] emphasised the need for source control in intra-abdominal infections, recommending surgical drainage for abscesses exceeding 3-5 cm. Our patient underwent diagnostic laparoscopy with drainage, in line with these guidelines, leading to rapid clinical recovery. Johansson et al. and Wong et al. recommended beta-lactams (penicillin's, cephalosporins) with anaerobic coverage (metronidazole) for intra-abdominal Streptococcus infections. Our patient received empirical IV antibiotics which aligned with the sensitivity report, followed by a switch to oral antibiotics, aligning with current recommendations.

One of the primary challenges in managing paediatric pelvic abscesses is the potential for delayed diagnosis. Symptoms can be nonspecific, and imaging studies may be required to confirm the presence and extent of the abscess. Magnetic resonance imaging (MRI) is particularly useful in evaluating soft tissue structures and can aid in differentiating deep seated pelvic abscesses from other conditions with similar presentations .

Another consideration is the potential for recurrence or complications such as fistulisation. A study by Kim et al. [7] found that the presence of postoperative malignant, complex-multilocular abscesses, and fungal infections in the cavity extended catheter duration and decreased the clinical success rate of drainage procedures . Therefore, careful monitoring and follow-up are essential to ensure complete resolution of the infection.

Conclusion

Our case highlights the role of Streptococcus species in paediatric intra-abdominal abscesses. Though not traditionally dominant, *Streptococcus* species, especially those in the *Streptococcus anginosus group* (SAG), are increasingly being recognized as potent pathogens in abdominal and pelvic abscesses. While appendicitis and bowel perforation were considered potential sources, the exact pathogenesis remains uncertain. The importance of considering post-traumatic infections in paediatric patients, even after minor injuries is vital as very often, these injuries are not witnessed by adults and the child may underestimate the severity or not disclose the severity due to fear of punishment. Early imaging, surgical drainage, and targeted antibiotic therapy remain the cornerstones of management.

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