# A Case of Group A Streptococcus Pelvic Inflammatory Disease complicated by Toxic Shock Syndrome

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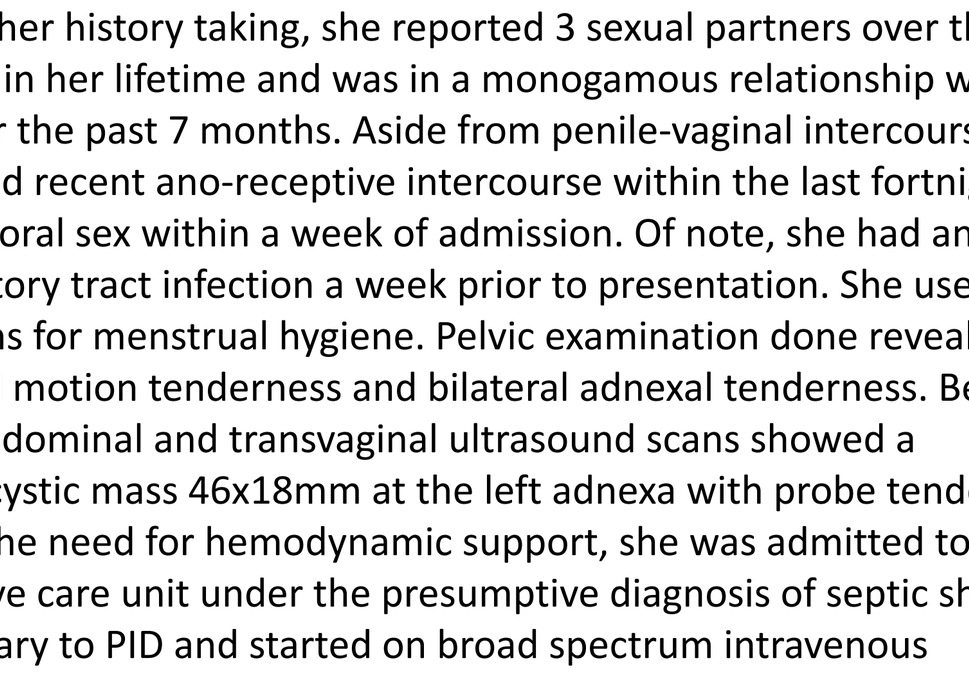
## Introduction

Streptococcal toxic shock syndrome (STSS) is defined as septic shock syndrome resulting from Group A streptococcus (GAS) infection with multi-organ involvement. We herein report the case of a 27-year-old lady presenting with symptoms of pelvic peritonitis complicated by septic shock with acute kidney injury and coagulopathy requiring admission to intensive care unit and single inotropic support. She was later diagnosed with STSS meeting CDC definition, secondary to GAS pelvic inflammatory disease (PID). Her clinical course eventually improved with antibiotic therapy.

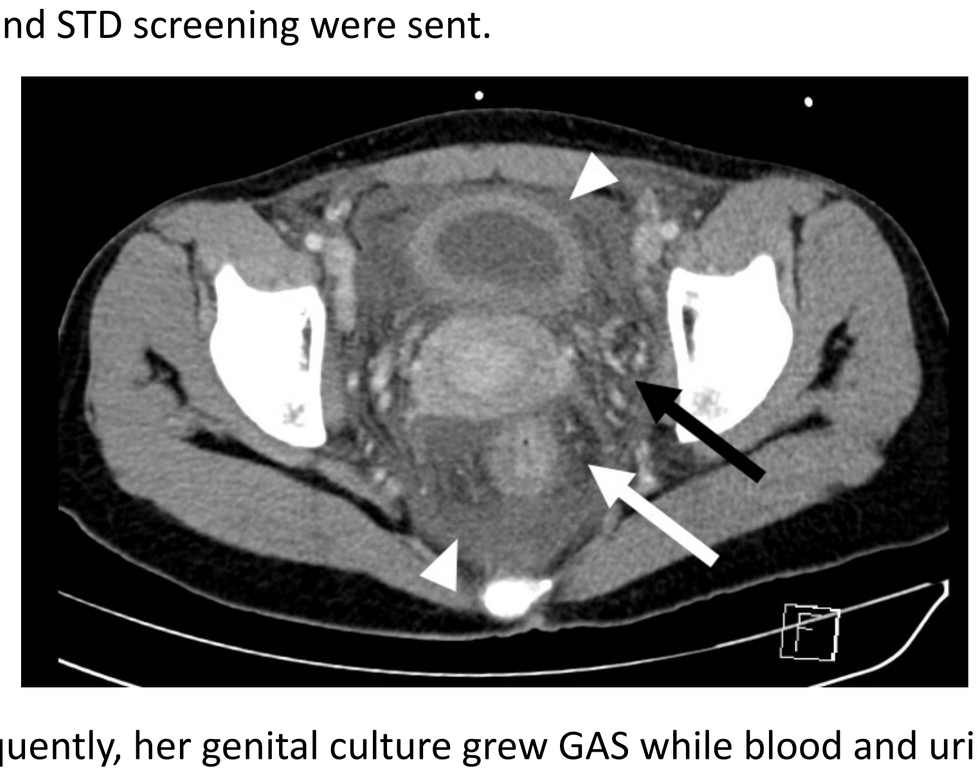
## Case Report

A 27-year-old healthy nulliparous lady presented to the emergency department with right iliac fossa pain and suprapubic pain associated with whitish vaginal discharge, fever, vomiting, diarrhea and loss of appetite of 1 day duration. On admission, the patient was acutely unwell and in septic shock. Her blood pressure was 90/47mmHg, heart rate 143bpm, febrile at 37.6 degrees, respiratory rate 17, SpO2 98% on room air. Her abdomen was tender on palpation over the right iliac fossa region but without any rebound tenderness or guarding. Bilateral vulval swelling and erythema was noted. Blood investigations showed acute kidney injury, raised inflammatory markers, high anion gap metabolic acidosis with raised lactate as well as coagulopathy. She required single inotropic support to maintain her blood pressure. A computed tomography (CT) scan of the thorax, abdomen and pelvis revealed moderate free fluid in the pelvis with gross pelvic peritonitis.

On further history taking, she reported 3 sexual partners over the past 2 years in her lifetime and was in a monogamous relationship with a man for the past 7 months. Aside from penile-vaginal intercourse, she reported recent ano-receptive intercourse within the last fortnight as well as oral sex within a week of admission. Of note, she had an upper respiratory tract infection a week prior to presentation. She uses tampons for menstrual hygiene. Pelvic examination done revealed cervical motion tenderness and bilateral adnexal tenderness. Bedside transabdominal and transvaginal ultrasound scans showed a tubulocystic mass 46x18mm at the left adnexa with probe tenderness. Given the need for hemodynamic support, she was admitted to the intensive care unit under the presumptive diagnosis of septic shock secondary to PID and started on broad spectrum intravenous antibiotics piperacillin-tazobactam. Cultures of blood, genital and urine and STD screening were sent.

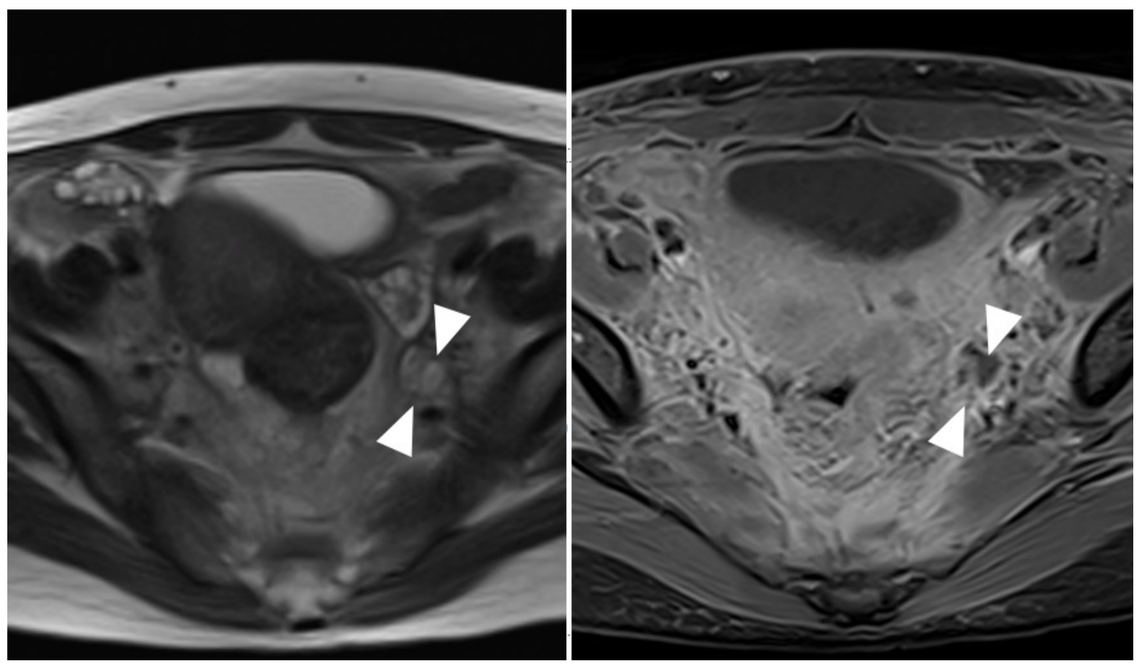


Subsequently, her genital culture grew GAS while blood and urine cultures and STD screening were negative. She was therefore diagnosed with STSS meeting CDC definition, secondary to GAS PID. A magnetic resonance imaging (MRI) of the pelvis was performed on day 3 of admission due to persistent anterior abdominal pain and vulvar swelling which showed marked anterior abdominal wall myositis and cellulitis.



She was referred to Plastic Surgery to exclude necrotizing fasciitis and Infectious Diseases for co-management. Stab incisions of bilateral labia majora were done which drained haemoserous fluid and cultures did not demonstrate any evidence of necrotizing fasciitis or collection in the vulva. Her antibiotic regime was narrowed to IV benzylpenicillin and IV clindamycin from D3 to D10 before being switched to IV amoxicillin/clavulanate acid and additional oral amoxicillin from D11 to D18.

She continued to improve clinically until D10 when repeat febrile spikes, rising inflammatory markers and new onset of persistent back pain necessitated a repeat MRI pelvis. The scan revealed multiple rim-enhancing collections in the presacral space extending to bilateral pelvic side walls measuring up to 22mm, in keeping with an abscess. These were drained by interventional radiology on 16th November 2023 via gluteal approach and 2mls of purulent serous fluid was aspirated. Fluid smear gram stain and cultures did not grow any organisms. Her inflammatory markers improved subsequently and there were no further febrile spikes.



She eventually made a complete clinical recovery and was discharged on day 16 with oral amoxicillin/clavulanate acid 625mg TDS and oral amoxicillin 500mg TDS. Interval MRI scans reported improvement in the abscess collections after completion of 4 weeks of antibiotics.

## Discussion

Acute PID is often due to ascending infection by sexually transmitted organisms including Neisseria Gonorrhoeae and Chlamydia Trachomatis. This can result in endometritis, salpingitis, tubo-ovarian abscess and pelvic peritonitis. Less commonly, acute PID cases are associated with enteric or respiratory pathogens such as GAS. GAS is commonly considered in the context of a pharyngeal infection, and there have been literature reports hypothesizing the possibility of transmission from mouth to genitalia with ascending infection resulting in GAS pelvic inflammatory disease.

GAS is known to produce a family of superantigenic exotoxins capable of activating a large quantity of CD4+ lymphocytes. This mechanism results in massive cytokine release, leading to the induction of septic shock. Symptoms of GAS infection tend to be poorly localised and have non-specific symptoms including fever, general malaise, abdominal pain, nausea and vomiting. Careful history taking and thorough physical examination is integral in diagnosis of an atypical presentation of GAS pelvic inflammatory disease.

Our case study met the CDC criteria for STSS with extension of inflammation to the lower abdominal wall resulting in multiple pelvic abscesses and vulva cellulitis. STSS carries a high mortality rate ranging from 30 to 70% with known complications of shock and organ failure, as well as tissue necrosis and loss of extremities. The crucial steps that led to her full recovery included early aggressive treatment with intravenous antibiotics, fluids and source control.

An important differential to rule out in persistent vulval swelling in the context of GAS infection would be type II necrotizing fasciitis, also known as haemolytic streptococcal gangrene. The most commonly involved GAS strains contain M protein types 1, 3, 12 and 28. Differentiating cellulitis and necrotizing fasciitis can be difficult when the presenting symptoms are non-specific, and imaging can delay diagnosis. As there is a high mortality rate of up to 50%, high clinical suspicion would necessitate early and extensive surgical debridement.

References:

1. Centers for Disease Control and Prevention (CDC). (2022). Streptococcal Toxic Shock Syndrome (STSS)
2. Centers for Disease Control and Prevention (CDC). (2022). Type II Necrotizing Fasciitis
3. Snyder A, Schmalzle SA. Spontaneous *Streptococcus pyogenes* pelvic inflammatory disease; Case report and review of the literature. IDCases. 2020 May 5;20:e00785. doi: 10.1016/j.idcr.2020.e00785. PMID: 32405460; PMCID: PMC7210579.
4. Iwata Y, Iwase S. Group A Streptococcal Peritonitis and Toxic Shock Syndrome in a Postmenopausal Woman. Intern Med. 2017 Sep 15;56(18):2523-2527. doi: 10.2169/internalmedicine.8552-16. Epub 2017 Aug 21. PMID: 28824068; PMCID: PMC5643186.
5. Tilanus AM, de Geus HR, Rijnders BJ, Dwarkasing RS, van der Hoven B, Bakker J. Severe group A streptococcal toxic shock syndrome presenting as primary peritonitis: a case report and brief review of the literature. Int J Infect Dis. 2010 Sep;14 Suppl 3:e208-12. doi: 10.1016/j.ijid.2009.07.014. Epub 2009 Nov 13. PMID: 19914115.