



Case Report

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Toxic Shock Syndrome in an Adolescent Girl Who Had Previous Hematometocolpos



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Abstract

We wish to report a rare, acute, challenging, potentially lethal and interesting case of a 15-year-old teenage girl who had previous hymenoplasty and drainage vaginal surgery for the imperforate hymen and hematometocolpos presented with features of acute systemic illness during her menstruation with use of ultra-absorbent tampon left for long periods. Initial primary care diagnosis was suspected urinary tract infection but subsequently she was diagnosed with staphylococcal menstrual toxic shock syndrome during her course in the hospital. The patient was successfully treated with prompt diagnosis, removal of tampon and supportive pediatric intensive care treatment and specialist care with good outcome.

Keywords: Congenital vaginal anomalies; Foreign body; Hematometocolpos; Hymenoplasty; Staphylococcal toxic shock syndrome; Retained ultra-absorbent tampon

Abbreviattaion: TSS: Toxic Shock Syndrome; TSLS: Toxic Shock-Like Syndrome; PICU: Pediatric Intensive Care Unit

Introduction

Congenital vaginal lesions are rare in general and that of imperforate hymen can present with a spectrum of disorders from a simple neonatal hydrometrocolpos via hematometocolpos to life-threatening entities like pyometocolpos and can predispose to some of the lesions in the later life [1-8]. Toxic shock syndrome (TSS) is a serious disease that involves fever, shock, and problems with several body organs. TSS is caused by a toxin produced by some types of staphylococcus bacteria [9]. A similar problem, called toxic shock-like syndrome (TSLS), can be caused by toxin from streptococcal bacteria [10]. Not all staphylococci or streptococci infections cause TSS/TSLS. We wish to present a case of TSS in a 15-year-old adolescent girl with successful outcome by management in the pediatric intensive care unit (PICU).

Case Report

Case of a 15-year-old teenage girl with the past medical his

tory of imperforate hymen and hematometocolpos for which she had hymenoplasty and drainage of hematometocolpos presented to local primary care physician and pediatrician following two days of worsening general ill feeling, confusion, malaise, body aches, abdominal pain, nausea, vomiting, loose stools, high fever with chills, significant light-headedness with hypotension. Urine analysis showed 30-40 white blood cells and positive for nitrites concerning for a urinary tract infection.

The primary care physician and pediatrician administered intravenous fluids and a dose of intravenous co-amoxiclav antibiotic and transferred her to the emergency room. Upon transfer to the emergency room, it was noted that this young girl was on day 4 of her menstrual cycle, has been on a long tour and had a forgotten retained tampon in place for approximately 30 hours. Tampon which had foul smell was removed immediately and vaginal swab was taken.

The emergency presentation was concerning for sepsis as she was febrile, tachycardic, hypotensive, poor capillary refill, and diffuse red blotchy petechial rash that looked like a sunburn. The temperature at presentation was 40. C, blood pressure 80/50 mm of Hg, had diffuse macular erythroderma petechial rash of palms and soles of feet, hematological test showed leucocytosis with high proportion of immature neutrophils and low platelets, biochemical tests revealed deranged renal and hepatic function tests. Blood, urine and stool cultures were obtained, and she was given 3 liters of normal saline to support her hypotensive state. Despite the 3 liters of normal saline, she remained hypotensive and required a continuous infusion of noradrenaline drip to improve her blood pressures. She was quickly admitted to the pediatric intensive care unit.

The intensive care course lasted 2 days with the resumption of blood pressures without further need for additional vasopressors. She required initial 3 doses of Lasix and an additional dose after chest radiograph due to compromised respiratory status with persistent fluid on both lungs and required oxygen. During PICU admission, she required total of five liters of normal saline, intravenous antibiotics, noradrenaline infusion for eighteen hours, total of four doses of Lasix and oxygen support for 2 days She stepped down to the acute care floors to continue her convalescence and was slowly weaned from oxygen before discharge home to family.

Infectious disease was consulted, and she was diagnosed with menstrual septic shock syndrome (mTSS) given the rapid improvement of multisystem symptoms, hypotension with intravenous fluids, rash, and removal of the retained tampon. The blood, urine and stool cultures were negative. This diagnosis was confirmed by a vaginal swab growing staphylococcus aureus. She was originally given Co-amoxiclav which was switched over to the combined dicloxacillin and clindamycin while inpatient. She was discharged home on oral clindamycin only for total of 14 days and instructed to no longer use tampons for the next 6 months and to not keep retained for longer than 8 hours at a time when resuming tampon use. At recent follow up, she is asymptomatic, well in herself without any recurrence.

Discussion

The earliest cases of TSS involved women who used tampons during their menstrual periods. However, today less than one half of cases are linked to tampon use. TSS can also occur with skin infections, burns, and after surgery. The condition can also affect children, postmenopausal women, and men [11]. TSS is a serious and sometimes fatal condition and a multisystem disorder first reported by Todd et.al in 1978 but was not brought to public attention until 1980 [12].

Risk factors for developing TSS include congenital vaginal anomalies, recent childbirth, infection with staphylococcus aureus (*S aureus*), commonly called a staph infection, foreign bodies or packings such as nasal packs used to stop nosebleeds, vaginal

packs, etc inside the body, menstrual period, recent surgery, tampon use especially if super absorbent and left in for a long time, and wound infection after surgery. TSS can occur from either staphylococcus aureus or streptococcus bacterium which can grow on the polyester foam and increase in vaginal pH associated with tampon use [13]. In our case imperforate hymen and overdistention of obstructed vagina may have predisposed to poor drainage of the menstrual blood and colonised the vagina with bacteria as an additional co-factor in the development of the TSS.

TSS is caused by staphylococcus aureus or streptococcus pyogenes. These bacteria are able to produce superantigens, which bypass normal antigen presentation and cause a clonal T-cell expansion and uncontrolled release of pro-inflammatory mediators, which results in severe multiple organ failure [14] Despite high morbidity and mortality, TSS remains underdiagnosed. The development of TSS requires a lack of antibodies to neutralize toxic shock syndrome toxin 1 and the presence of Staphylococcus aureus in the vaginal flora [15].

The criteria for TSS includes having six of the following multisystem symptoms. These symptoms are fever, diffuse macular rash, hypotension which responds well to fluid resuscitation, gastrointestinal symptoms, muscular-skeletal, renal, hepatic, hematologic, and disorientation or alterations in consciousness. All women have had menstrual cycles at the time of presentation and tampon use has been associated with most cases [15]. TSS is an acute toxin-mediated infectious syndrome with an incidence of 0.79/100,000 women, particularly in the adolescent population, and it may be menstrual (mTSS) or non-menstrual (nmTSS) in origin.

No single test can diagnose toxic shock syndrome. The presence of fever, hypotension, petechial rash that peels after 1 to 2 weeks, problems with the function of at least 3 organs and in some cases, cultures may be positive for growth of staphylococcus aureus or streptococcus pyogenes.

Treatment includes removal of materials, such as tampons, vaginal sponges, or nasal packing. The goal of treatment is to maintain important body functions. This may include intravenous fluids, vasopressors to maintain blood pressure, antibiotics with a combination of beta-lactam antibiotics and clindamycin, intravenous gamma globulin in severe cases, staying in the hospital intensive care unit (ICU) for monitoring and organ support in the form of hemofiltration/dialysis in case of severe renal dysfunction.

Complications may include persistent shock; organ damage including kidney, heart and liver failure; recurrence of TSS and the mortality is relatively high in 8-10 % of late or severe cases. Emergency physicians should always have a high index of suspicion for TSS in young females presenting without another obvious cause of shock. A pelvic examination should always be completed in these cases [16].

Conclusion

In general, early diagnosis of this condition and prompt referral to specialist center is key to successful treatment. In order to reduce morbidity and mortality early diagnosis and prompt treatment with a combination of intravenous fluids with vasopressors and beta-lactam antibiotics, clindamycin and intravenous immunoglobulin is essential. TSS is a medical emergency. mTSS should be considered in the differential diagnosis of an adolescent presenting with signs of septic shock, a rash, fever, and feel ill, particularly during menstruation and tampon use and pelvic examination should always be completed. Prevention or reduction of risk for mTSS can be possible by menstrual health hygiene education to adolescents, handwashing before placement, avoiding highly absorbent tampons, changing tampons frequently at least every 8 hours, no overnight retention, and only using tampons once in a while during menstruation such as during travel or social event convenience.

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Author Contributions

All authors contributed to the conduct of this work. All authors also declare having read and approved the final version of the manuscript.

Ethical Approval

All procedures performed on human participants were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

Informed Consent

Informed consent was obtained from the parents and all the relatives involved prior to all the procedures. Parents and all involved parties were informed about the procedure.

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