

# World Journal of *Clinical Cases*

*World J Clin Cases* 2021 November 26; 9(33): 10052-10391



## Contents

Thrice Monthly Volume 9 Number 33 November 26, 2021

### REVIEW

- 10052** Effects of alcohol consumption on viral hepatitis B and C  
*Xu HQ, Wang CG, Zhou Q, Gao YH*

### MINIREVIEWS

- 10064** Effects of anti-diabetic drugs on sarcopenia: Best treatment options for elderly patients with type 2 diabetes mellitus and sarcopenia  
*Ma XY, Chen FQ*

### ORIGINAL ARTICLE

#### Retrospective Cohort Study

- 10075** Utility of cooling patches to prevent hand-foot syndrome caused by pegylated liposomal doxorubicin in breast cancer patients  
*Zheng YF, Fu X, Wang XX, Sun XJ, He XD*

#### Retrospective Study

- 10088** Clinicopathological features of small T1 colorectal cancers  
*Takashina Y, Kudo SE, Ichimasa K, Kouyama Y, Mochizuki K, Akimoto Y, Maeda Y, Mori Y, Misawa M, Ogata N, Kudo T, Hisayuki T, Hayashi T, Wakamura K, Sawada N, Baba T, Ishida F, Yokoyama K, Daita M, Nemoto T, Miyachi H*
- 10098** Comparison of dental pulp periodontal therapy and conventional simple periodontal therapy as treatment modalities for severe periodontitis  
*Li L, Chen HJ, Lian Y, Wang T*
- 10106** Tripartite intensive intervention for prevention of rebleeding in elderly patients with hypertensive cerebral hemorrhage  
*Li CX, Li L, Zhang JF, Zhang QH, Jin XH, Cai GJ*
- 10116** Clinical and electroencephalogram characteristics and treatment outcomes in children with benign epilepsy and centrotemporal spikes  
*Chen RH, Li BF, Wen JH, Zhong CL, Ji MM*
- 10126** Endoscopic ultrasonography diagnosis of gastric glomus tumors  
*Bai B, Mao CS, Li Z, Kuang SL*
- 10134** Learning curves of robot-assisted pedicle screw fixations based on the cumulative sum test  
*Yu J, Zhang Q, Fan MX, Han XG, Liu B, Tian W*
- 10143** Value of GRACE and SYNTAX scores for predicting the prognosis of patients with non-ST elevation acute coronary syndrome  
*Wang XF, Zhao M, Liu F, Sun GR*

- 10151** Effectiveness of enhanced recovery after surgery in the perioperative management of patients with bone surgery in China

*Zhao LY, Liu XT, Zhao ZL, Gu R, Ni XM, Deng R, Li XY, Gao MJ, Zhu WN*

### Clinical Trials Study

- 10161** Association between plasma dipeptidyl peptidase-4 levels and cognitive function in perinatal pregnant women with gestational diabetes mellitus

*Sana SRGL, Li EY, Deng XJ, Guo L*

- 10172** Paricalcitol in hemodialysis patients with secondary hyperparathyroidism and its potential benefits

*Chen X, Zhao F, Pan WJ, Di JM, Xie WN, Yuan L, Liu Z*

### Observational Study

- 10180** Did the severe acute respiratory syndrome-coronavirus 2 pandemic cause an endemic *Clostridium difficile* infection?

*Cojocariu C, Girleanu I, Trifan A, Olteanu A, Muzica CM, Huiban L, Chiriac S, Singeap AM, Cuciureanu T, Sfarti C, Stanciu C*

- 10189** Effect of nursing intervention based on Maslow's hierarchy of needs in patients with coronary heart disease interventional surgery

*Xu JX, Wu LX, Jiang W, Fan GH*

- 10198** Impacts of statin and metformin on neuropathy in patients with type 2 diabetes mellitus: Korean Health Insurance data

*Min HK, Kim SH, Choi JH, Choi K, Kim HR, Lee SH*

### META-ANALYSIS

- 10208** Is endoscopic retrograde appendicitis therapy a better modality for acute uncomplicated appendicitis? A systematic review and meta-analysis

*Wang Y, Sun CY, Liu J, Chen Y, Bhan C, Tuason JPW, Misra S, Huang YT, Ma SD, Cheng XY, Zhou Q, Gu WC, Wu DD, Chen X*

- 10222** Prognostic value of ground glass opacity on computed tomography in pathological stage I pulmonary adenocarcinoma: A meta-analysis

*Pan XL, Liao ZL, Yao H, Yan WJ, Wen DY, Wang Y, Li ZL*

### CASE REPORT

- 10233** Atrial fibrillation and concomitant left subclavian, axillary and brachial artery embolism after fiberoptic bronchoscopy: A case report

*Yang CL, Zhou R, Jin ZX, Chen M, Zi BL, Li P, Zhou KH*

- 10238** Streptococcal toxic shock syndrome after hemorrhoidectomy: A case report

*Lee CY, Lee YJ, Chen CC, Kuo LJ*

- 10244** Subsequent placenta accreta after previous mifepristone-induced abortion: A case report

*Zhao P, Zhao Y, He J, Bai XX, Chen J*

- 10249** Autosomal dominant tubulointerstitial kidney disease with a novel heterozygous missense mutation in the uromodulin gene: A case report  
*Zhang LL, Lin JR, Zhu TT, Liu Q, Zhang DM, Gan LW, Li Y, Ou ST*
- 10257** Novel KDM6A mutation in a Chinese infant with Kabuki syndrome: A case report  
*Guo HX, Li BW, Hu M, Si SY, Feng K*
- 10265** Pancreatic cancer with synchronous liver and colon metastases: A case report  
*Dong YM, Sun HN, Sun DC, Deng MH, Peng YG, Zhu YY*
- 10273** Veno-venous-extracorporeal membrane oxygenation treatment for severe capillary leakage syndrome: A case report  
*Nong WX, Lv QJ, Lu YS*
- 10279** Anticoagulant treatment for pulmonary embolism in patient with cerebral hemorrhage secondary to mechanical thrombectomy: A case report  
*Chen XT, Zhang Q, Zhou CQ, Han YF, Cao QQ*
- 10286** Complete restoration of congenital conductive hearing loss by staged surgery: A case report  
*Yoo JS, Lee CM, Yang YN, Lee EJ*
- 10293** Blastic plasmacytoid dendritic cell neoplasm with skin and bone marrow involvement: Report of three cases  
*Guo JH, Zhang HW, Wang L, Bai W, Wang JF*
- 10300** Extracranial multiorgan metastasis from primary glioblastoma: A case report  
*Luan XZ, Wang HR, Xiang W, Li SJ, He H, Chen LG, Wang JM, Zhou J*
- 10308** Transverse myelitis after infection with varicella zoster virus in patient with normal immunity: A case report  
*Yun D, Cho SY, Ju W, Seo EH*
- 10315** Duodenal ulcer caused by coil wiggle after digital subtraction angiography-guided embolization: A case report  
*Xu S, Yang SX, Xue ZX, Xu CL, Cai ZZ, Xu CZ*
- 10323** Crab lice infestation in unilateral eyelashes and adjacent eyelids: A case report  
*Tang W, Li QQ*
- 10328** Local random flaps for cervical circumferential defect or tracheoesophageal fistula reconstruction after failed gastric pull-up: Two case reports  
*Zhang Y, Liu Y, Sun Y, Xu M, Wang XL*
- 10337** Incurable and refractory spinal cystic echinococcosis: A case report  
*Zhang T, Ma LH, Liu H, Li SK*
- 10345** Individualized treatment of breast cancer with chronic renal failure: A case report and review of literature  
*Cai JH, Zheng JH, Lin XQ, Lin WX, Zou J, Chen YK, Li ZY, Chen YX*

- 10355** Persistent fibrinogen deficiency after snake bite: A case report  
*Xu MH, Li J, Han L, Chen C*
- 10362** Successful prolonged cardiopulmonary resuscitation after intraoperative cardiac arrest due to povidone-iodine allergy: A case report  
*Xiang BB, Yao YT, Jiao SL*
- 10369** Clinical algorithm for preventing missed diagnoses of occult cervical spine instability after acute trauma: A case report  
*Zhu C, Yang HL, Im GH, Liu LM, Zhou CG, Song YM*
- 10374** Carbon ion radiotherapy for synchronous choroidal melanoma and lung cancer: A case report  
*Zhang YS, Hu TC, Ye YC, Han JH, Li XJ, Zhang YH, Chen WZ, Chai HY, Pan X, Wang X, Yang YL*
- 10382** Heart failure as an adverse effect of infliximab for Crohn's disease: A case report and review of the literature  
*Grillo TG, Almeida LR, Beraldo RF, Marcondes MB, Queiróz DAR, da Silva DL, Quera R, Baima JP, Saad-Hossne R, Sasaki LY*

**ABOUT COVER**

Editorial Board Member of *World Journal of Clinical Cases*, Jian-Wu Zhao, PhD, Chief Physician, Professor, Department of Orthopedics, Jilin University Second Hospital, Changchun 130000, Jilin Province, China. [jianwu@jlu.edu.cn](mailto:jianwu@jlu.edu.cn)

**AIMS AND SCOPE**

The primary aim of *World Journal of Clinical Cases* (WJCC, *World J Clin Cases*) is to provide scholars and readers from various fields of clinical medicine with a platform to publish high-quality clinical research articles and communicate their research findings online.

WJCC mainly publishes articles reporting research results and findings obtained in the field of clinical medicine and covering a wide range of topics, including case control studies, retrospective cohort studies, retrospective studies, clinical trials studies, observational studies, prospective studies, randomized controlled trials, randomized clinical trials, systematic reviews, meta-analysis, and case reports.

**INDEXING/ABSTRACTING**

The WJCC is now indexed in Science Citation Index Expanded (also known as SciSearch®), Journal Citation Reports/Science Edition, Scopus, PubMed, and PubMed Central. The 2021 Edition of Journal Citation Reports® cites the 2020 impact factor (IF) for WJCC as 1.337; IF without journal self cites: 1.301; 5-year IF: 1.742; Journal Citation Indicator: 0.33; Ranking: 119 among 169 journals in medicine, general and internal; and Quartile category: Q3. The WJCC's CiteScore for 2020 is 0.8 and Scopus CiteScore rank 2020: General Medicine is 493/793.

**RESPONSIBLE EDITORS FOR THIS ISSUE**

Production Editor: Ji-Hong Lin; Production Department Director: Xiang Li; Editorial Office Director: Jin-Lai Wang.

**NAME OF JOURNAL**

*World Journal of Clinical Cases*

**ISSN**

ISSN 2307-8960 (online)

**LAUNCH DATE**

April 16, 2013

**FREQUENCY**

Thrice Monthly

**EDITORS-IN-CHIEF**

Dennis A Bloomfield, Sandro Vento, Bao-Gan Peng

**EDITORIAL BOARD MEMBERS**

<https://www.wjgnet.com/2307-8960/editorialboard.htm>

**PUBLICATION DATE**

November 26, 2021

**COPYRIGHT**

© 2021 Baishideng Publishing Group Inc

**INSTRUCTIONS TO AUTHORS**

<https://www.wjgnet.com/bpg/gerinfo/204>

**GUIDELINES FOR ETHICS DOCUMENTS**

<https://www.wjgnet.com/bpg/GerInfo/287>

**GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH**

<https://www.wjgnet.com/bpg/gerinfo/240>

**PUBLICATION ETHICS**

<https://www.wjgnet.com/bpg/GerInfo/288>

**PUBLICATION MISCONDUCT**

<https://www.wjgnet.com/bpg/gerinfo/208>

**ARTICLE PROCESSING CHARGE**

<https://www.wjgnet.com/bpg/gerinfo/242>

**STEPS FOR SUBMITTING MANUSCRIPTS**

<https://www.wjgnet.com/bpg/GerInfo/239>

**ONLINE SUBMISSION**

<https://www.f6publishing.com>

# Streptococcal toxic shock syndrome after hemorrhoidectomy: A case report

Chien-Yu Lee, Yuarn-Jang Lee, Chia-Che Chen, Li-Jen Kuo

**ORCID number:** Chien-Yu Lee 0000-0001-9697-4608; Yuarn-Jang Lee 0000-0002-1255-1331; Chia-Che Chen 0000-0001-5646-3803; Li-Jen Kuo 0000-0002-4865-325X.

**Author contributions:** Lee CY wrote the manuscript; Lee YJ and Chen CC participated in patient care; Chen CC collected the data; Kuo LJ reviewed and edited the manuscript.

**Informed consent statement:**

Informed written consent was obtained from the patient for publication of this report and any accompanying images.

**Conflict-of-interest statement:** The authors declare that they have no conflict of interest.

**CARE Checklist (2016) statement:**

The authors have read the CARE Checklist (2016), and the manuscript was prepared and revised according to the CARE Checklist (2016).

**Country/Territory of origin:** Taiwan

**Specialty type:** Surgery

**Provenance and peer review:**

Unsolicited article; Externally peer reviewed.

**Peer-review report's scientific quality classification**

Grade A (Excellent): 0

**Chien-Yu Lee**, Department of Pediatrics, Taoyuan General Hospital, Ministry of Health and Welfare, Taoyuan 32748, Taiwan

**Yuarn-Jang Lee**, Division of Infectious Diseases, Department of Internal Medicine, Taipei Medical University Hospital, Taipei 11031, Taiwan

**Yuarn-Jang Lee**, Division of Infectious Diseases, Department of Internal Medicine, School of Medicine, College of Medicine, Taipei Medical University, Taipei 11031, Taiwan

**Chia-Che Chen, Li-Jen Kuo**, Division of Colorectal Surgery, Department of Surgery, Taipei Medical University Hospital, Taipei 11031, Taiwan

**Li-Jen Kuo**, Department of Surgery, School of Medicine, College of Medicine, Taipei Medical University, Taipei 11031, Taiwan

**Corresponding author:** Li-Jen Kuo, MD, Chief Doctor, Division of Colorectal Surgery, Department of Surgery, Taipei Medical University Hospital, No. 252 Wuxing Street, Sinyi District, Taipei 11031, Taiwan. [kuolijen@gmail.com](mailto:kuolijen@gmail.com)

## Abstract

### BACKGROUND

Streptococcal toxic-shock syndrome after hemorrhoidectomy is rare but may be catastrophic. Group A streptococci have produced various surface proteins and exotoxins due to genetic changes to fight the human body's immune response. Though life threatening infection after hemorrhoidectomy rarely occurs, all surgeons should be aware of the potential complications of severe sepsis after hemorrhoidectomy and keep in mind their clinical presenting features in order to diagnose early and administer appropriate and effective therapeutic drugs early.

### CASE SUMMARY

Here, we present a case of a 56-year-old man with a painful thrombotic external hemorrhoid who presented to our outpatient department for management. There was no history of systemic diseases or recent disease infection. Hemorrhoidectomy was suggested and performed. After surgery, the patient developed hypotension, tachycardia, fever with chills and renal function impairment on day 2 post-operation. The clinical condition progressed to severe septic shock and metabolic acidosis. The patient responded poorly to treatment and expired after 1 d even with use of extracorporeal membrane oxygenation. The results of the blood and wound cultures showed group A streptococcus pyogenes.

Grade B (Very good): B  
 Grade C (Good): 0  
 Grade D (Fair): 0  
 Grade E (Poor): 0

**Open-Access:** This article is an open-access article that was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution NonCommercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>

**Received:** March 12, 2021

**Peer-review started:** March 12, 2021

**First decision:** April 13, 2021

**Revised:** April 22, 2021

**Accepted:** October 14, 2021

**Article in press:** October 14, 2021

**Published online:** November 26, 2021

**P-Reviewer:** Xavier-Elsas P

**S-Editor:** Gong ZM

**L-Editor:** Filipodia

**P-Editor:** Gong ZM



## CONCLUSION

Although extremely uncommon, all surgeons should be aware of these potential life-threatening septic complications and alert to the presenting features for patients receiving hemorrhoidectomy.

**Key Words:** Hemorrhoid; Sepsis; *Streptococcus pyogenes*; Streptococcal toxic shock syndrome; Case report

©The Author(s) 2021. Published by Baishideng Publishing Group Inc. All rights reserved.

**Core Tip:** Group A *Streptococcus* (GAS; *Streptococcus pyogenes*) causes a broad spectrum of infections, including skin and soft tissue infections, tonsillitis, postpartum endometritis, puerperal sepsis, necrotizing soft tissue infection, and toxic shock syndrome (TSS). Though GAS infection and streptococcal TSS rarely happen after hemorrhoid treatment, all surgeons should be aware of the potential complications of severe sepsis after hemorrhoidectomy and keep in mind their clinical presenting features in order to diagnose early and administer appropriate and effective therapeutic drugs early.

**Citation:** Lee CY, Lee YJ, Chen CC, Kuo LJ. Streptococcal toxic shock syndrome after hemorrhoidectomy: A case report. *World J Clin Cases* 2021; 9(33): 10238-10243

**URL:** <https://www.wjgnet.com/2307-8960/full/v9/i33/10238.htm>

**DOI:** <https://dx.doi.org/10.12998/wjcc.v9.i33.10238>

## INTRODUCTION

Streptococcal toxic shock syndrome (STSS) occurs as a serious complication of invasive group A streptococcus (GAS) and 30%-70% of patients die in spite of aggressive treatments[1-3]. The criteria to define STSS include the isolation of GAS from a normally sterile site, hypotension, and involvement of at least two organ systems (renal impairment, coagulopathy, abnormal liver function, acute respiratory distress syndrome, skin rash, or soft tissue necrosis)[4]. Though GAS infection and STSS rarely happen after hemorrhoid treatment, catastrophic complications indeed do occur. All surgeons should be aware of the potential complications of severe sepsis after hemorrhoidectomy. The GAS infection following hemorrhoidectomy should be considered even when there is little to find on examination and the presenting features of STSS should be kept in mind.

## CASE PRESENTATION

### Chief complaints

The 56-year-old man was seen in our outpatient department because of sudden onset severe anal pain.

### History of present illness

The patient had a history of external hemorrhoids for 20 years and denied any systemic diseases. This time, he visited our outpatient department because of sudden onset severe anal pain and bleeding.

### History of past illness

The patient had a free previous medical history.

### Personal and family history

No significant personal or family history was identified.



### **Physical examination**

Rectal examination showed a thrombosed external protruding hemorrhoid and surgery was suggested because of acute pain. Preoperative blood pressure was 108/96 mmHg, the pulse was 59 beats per minute, the oxygen saturation was 100% under ambient air at rest and other examination results were normal.

### **Laboratory examinations**

Routine laboratory examinations were within normal limits.

### **Imaging examinations**

Routine chest X-ray examination was normal.

---

## **FINAL DIAGNOSIS**

Acute thrombotic hemorrhoids with bleeding and severe anal pain.

---

## **TREATMENT**

The patient received hemorrhoidectomy immediately after his outpatient department visit.

---

## **OUTCOME AND FOLLOW-UP**

The patient received hemorrhoidectomy immediately after his outpatient department visit. Hemorrhoidectomy was performed smoothly. After the operation, the patient was sent back to the ward of general surgery and vital signs were similar to those from preoperative examination. On the morning of day 1 post-operation, his temperature was 36.4 °C, blood pressure was 85/50 mmHg, and pulse was 83 beats per minute. On examination, the patient had good spirits and fair activity without any discomfort except for moderate wound pain (VAS = 5). The wound showed mild swelling and no pus or bloody discharge. Mefenamic acid 250mg QID PO and Pethidine 50mg PRN were prescribed for pain relief. Increased pulse rates to 108 beats per minute and persistent hypotension (76/54 mmHg) were noted on day 2 post-operation. The patient appeared well and denied having dizziness, chills, weakness, poor appetite or low urine output. Sepsis, stress ulcer induced gastrointestinal bleeding and dehydration were first considered but the patient denied tarry stool and epigastric discomfort. Due to the hypotension, we planned to give intravenous fluid, but the patient refused to establish an intravenous line because of fear of pain; thus, water intake was encouraged and vital signs were closely monitored. On the morning of day 3 post-operation, the patient had fever to 38.6 °C with mention of chills. His blood pressure was 70/42 mmHg, his pulse was 124 beats per minute, and his oxygen saturation was 97% under ambient air. Two sets of blood cultures and laboratory tests were immediately obtained. The laboratory result revealed leukocytosis (white blood cell, 13100/ $\mu$ L), elevated C-reactive protein (33.12 mg/dL), blood urea nitrogen (40.6 mg/dL), creatinine (2.6 mg/dL) and decreased platelets (81000/ $\mu$ L). Intravenous fluid and antibiotics (Cefmetazole, 1g, Q8H) were given due to suspected sepsis. We rechecked vital signs after 2 h, and found his blood pressure was 155/110 mmHg, his pulse was 88 beats per minute, and his oxygen saturation was 95% under ambient air. The patient started to complain of general soreness and discomfort. After 6 h, the patient underwent a consciousness change, as noted by his family. On examination, we found a body temperature of 36.1 °C, blood pressure of 68/51 mmHg, pulse of 144 beats per minute, respiratory rate of 27 per minute and oxygen saturation of 95% under ambient air. Immediate intravenous fluid resuscitation was performed and artery blood gas analysis revealed pH 7.32, pCO<sub>2</sub> 16.9 mmHg, pO<sub>2</sub> 118.9 mmHg, and HCO<sub>3</sub> 8.5 mmol/L. The patient was sent to the intensive care unit and an endotracheal tube was put in place because of low oxygen saturation and tachypnea. Sodium bicarbonate was given and due to persistent metabolic acidosis, continuous venous-venous hemofiltration was arranged. Sudden cardiac arrest happened after continuous venous-venous hemofiltration. Cardiopulmonary resuscitation was performed and emergent extracorporeal membrane oxygenation (ECMO) was applied to sustain

circulation and tissue perfusion. Although there was neither significant swelling nor pus discharge of the anal wound, a swab culture from the deep wound was obtained. The patient experienced cardiac arrest again 2 h after ECMO placement and expired. The blood and wounds culture both yielded *Streptococcus pyogenes*.

## DISCUSSION

Hemorrhoids are a common disease with the prevalence of 4.4%-11% throughout the population[5,6]. Hemorrhoidectomy is an efficient and advantageous way to cure hemorrhoids, especially when patients fail to respond to conservative measures[7]. The postoperative complications of hemorrhoidectomy include fecal impaction, infection, urinary retention, bleeding and anus stenosis. The overall postoperative complications rate is approximately 3% and septic complication following treatment of hemorrhoids is rare[8-10]. The predominant organisms isolated in those patients with septic complications are *Escherichia coli* and *Bacteroides*[9,10]. Only one study to date has reported *Streptococcus pyogenes* induced necrotizing fasciitis and toxic shock syndrome after hemorrhoidectomy similar to the case we presented[11].

Group A *Streptococcus* (GAS; *Streptococcus pyogenes*) causes a broad spectrum of infections, including skin and soft tissue infections, tonsillitis, postpartum endometritis, puerperal sepsis, necrotizing soft tissue infection, and toxic shock syndrome (TSS)[12]. Invasive group A streptococcal (invasive GAS) disease is relatively rare but is often complicated by shock and multiorgan failure and is associated with high mortality and morbidity[1-3]. The incidence of invasive GAS diseases is high in adults > 50 years of age and young children and most patients are not immunocompromised[2,3,13]. Streptococcal TSS (STSS) occurs as a serious complication of invasive GAS disease in approximately one-third of cases and 30% to 70% of patients die in spite of aggressive treatments[14,15]. The criteria to define STSS includes the isolation of GAS from a normally sterile site, hypotension, and involvement of at least two organ systems (renal impairment, coagulopathy, abnormal liver function, acute respiratory distress syndrome, skin rash, or soft tissue necrosis) (Table 1)[4]. Our patient fulfilled the diagnostic criteria of confirmed STSS, without the presentation of necrotizing fasciitis. The pathogenic mechanisms of STSS are not completely understood because each is the culmination of complex interactions between the defense abilities of the human host and specific virulence factors of GAS [16]. Streptococcal pyrogenic exotoxins and other proteins act as superantigens and trigger excessive T cell response and secretion of massive inflammatory cytokines producing capillary leakage and arterial hypotension[17]. Predisposing factors for invasive GAS are minor trauma, including injuries resulting in hematoma, bruising, muscle strain, recent surgery, viral infection (e.g., influenza, varicella, etc.), alcohol abuse, immunosuppression, chronic lung disease, intravenous drug use, heart disease, diabetes, cancer, and recent child birth[18]. Risk factors identified in our patient included thrombosed hemorrhoid, recent surgery (hemorrhoidectomy) and age > 50 years.

Bacteria do colonize anal wounds following open hemorrhoidectomy[19]. *E. coli*, followed by *Staphylococcus aureus* and *Staphylococcus epidermidis* are the most dominant organisms[19]. However, overt wound infection after routine hemorrhoid surgery is rare (1.4%) and routine prophylactic antibiotic use is unnecessary[20,21]. In thrombosed hemorrhoid and septic complications after hemorrhoid treatment, *E. coli* and anaerobes are the predominant pathogens[10,11,22]. In our patient, a thrombosed hemorrhoid and open hemorrhoidectomy provided a portal of entry for GAS. This could explain local or indeed distant sepsis.

The systemic review of McCloud *et al*[9] reported 38 patients with life threatening sepsis following treatment for hemorrhoids. Of these, all were well prior to surgery with the exception of two (one was a case of human immunodeficiency virus infection and the other had drug-induced agranulocytosis). The predominant organisms isolated in these patients were *Escherichia coli*, *Bacteroides fragilis*, and *Staphylococcus aureus*. Only one study to date reported *Streptococcus pyogenes* induced STSS after hemorrhoidectomy[11], similar to the case presented here. In the literature reviewed by McCloud *et al*[9], 10 patients died and seven of them had initial presentations of septic shock; conversely, only 2 of the 28 survival cases developed septic shock at initial presentation. In our case, the most important presentation was septic shock without local wound necrosis. The fierce progression of GAS infection related to TSS calls for early aggressive intervention due to the high mortality and morbidity rate[14, 15].

**Table 1 Clinical criteria for streptococcal toxic-shock syndrome**

**Hypotension defined by a systolic blood pressure less than or equal to 90 mmHg for adults or less than the fifth percentile by age for children aged less than 16 years**

Multiple organ involvement characterized by two or more of the following:

Renal impairment: creatinine  $\geq 2$  mg/dL ( $\geq 177$   $\mu$ mol/L) for adults or  $\geq$  twice the upper limit of normal for age. In patients with preexisting renal disease,  $>$  twofold elevation baseline creatinine levels

Coagulopathy: platelets  $\leq 100000/\text{mm}^3$  ( $\leq 100 \times 10^6/\text{L}$ ) and/or disseminated intravascular coagulation, defined by prolonged clotting times, low fibrinogen level, and the presence of fibrin degradation products

Liver abnormalities: alanine aminotransferase, aspartate aminotransferase, or total bilirubin levels  $\geq$  twice the upper limit of normal for the patient's age. In patients with preexisting liver disease, a  $>$  twofold increase over baseline levels

Acute respiratory distress syndrome: defined by acute onset of diffuse pulmonary infiltrates and hypoxemia in the absence of cardiac failure or by evidence of diffuse capillary leak manifested by acute onset of generalized edema, or pleural or peritoneal effusions with hypoalbuminemia

A generalized erythematous macular rash that may desquamate

Soft tissue necrosis, including necrotizing fasciitis or myositis, or gangrene

Laboratory criteria for diagnosis:

Isolation of group A streptococcus

## CONCLUSION

Though GAS infection and STSS rarely happen after hemorrhoid treatment, catastrophic complications indeed do occur. All surgeons should be aware of the potential complications of severe sepsis after hemorrhoidectomy. The GAS infection following hemorrhoidectomy should be considered even when there is little to find on examination and the presenting features of STSS should be kept in mind.

## REFERENCES

- 1 **Kiska DL**, Thiede B, Caracciolo J, Jordan M, Johnson D, Kaplan EL, Gruninger RP, Lohr JA, Gilligan PH, Denny FW Jr. Invasive group A streptococcal infections in North Carolina: epidemiology, clinical features, and genetic and serotype analysis of causative organisms. *J Infect Dis* 1997; **176**: 992-1000 [PMID: [9333158](#) DOI: [10.1086/516540](#)]
- 2 **Nielsen HU**, Kolmos HJ, Frimodt-Møller N. Beta-hemolytic streptococcal bacteremia: a review of 241 cases. *Scand J Infect Dis* 2002; **34**: 483-486 [PMID: [12195872](#) DOI: [10.1080/00365540110080737](#)]
- 3 **Ispahani P**, Donald FE, Aveline AJ. Streptococcus pyogenes bacteraemia: an old enemy subdued, but not defeated. *J Infect* 1988; **16**: 37-46 [PMID: [3284952](#) DOI: [10.1016/s0163-4453\(88\)96073-2](#)]
- 4 Defining the group A streptococcal toxic shock syndrome. Rationale and consensus definition. The Working Group on Severe Streptococcal Infections. *JAMA* 1993; **269**: 390-391 [PMID: [8418347](#)]
- 5 **Everhart JE**, Ruhl CE. Burden of digestive diseases in the United States part I: overall and upper gastrointestinal diseases. *Gastroenterology* 2009; **136**: 376-386 [PMID: [19124023](#) DOI: [10.1053/j.gastro.2008.12.015](#)]
- 6 **Sheikh P**, Régnier C, Goron F, Salmat G. The prevalence, characteristics and treatment of hemorrhoidal disease: results of an international web-based survey. *J Comp Eff Res* 2020; **9**: 1219-1232 [PMID: [33079605](#) DOI: [10.2217/ceer-2020-0159](#)]
- 7 **Pattana-arun J**, Wesarachawit W, Tantiphlachiva K, Atithansakul P, Sahakitrunguang C, Rojanasakul A. A comparison of early postoperative results between urgent closed hemorrhoidectomy for prolapsed thrombosed hemorrhoids and elective closed hemorrhoidectomy. *J Med Assoc Thai* 2009; **92**: 1610-1615 [PMID: [20043562](#)]
- 8 **Bleday R**, Pena JP, Rothenberger DA, Goldberg SM, Buls JG. Symptomatic hemorrhoids: current incidence and complications of operative therapy. *Dis Colon Rectum* 1992; **35**: 477-481 [PMID: [1568400](#) DOI: [10.1007/BF02049406](#)]
- 9 **McCloud JM**, Jameson JS, Scott AN. Life-threatening sepsis following treatment for hemorrhoids: a systematic review. *Colorectal Dis* 2006; **8**: 748-755 [PMID: [17032319](#) DOI: [10.1111/j.1463-1318.2006.01028.x](#)]
- 10 **Guy RJ**, Seow-Choen F. Septic complications after treatment of hemorrhoids. *Br J Surg* 2003; **90**: 147-156 [PMID: [12555289](#) DOI: [10.1002/bjs.4008](#)]
- 11 **Cozar Ibañez A**, del Olmo Escribano M, Jiménez Armenteros F, Moreno Montesinos JM. [Necrotizing fasciitis and streptococcal toxic shock syndrome after hemorrhoidectomy]. *Rev Esp Enferm Dig* 2003; **95**: 68-70 [PMID: [12760734](#)]
- 12 **Waddington CS**, Snelling TL, Carapetis JR. Management of invasive group A streptococcal

- infections. *J Infect* 2014; **69** Suppl 1: S63-S69 [PMID: 25307276 DOI: 10.1016/j.jinf.2014.08.005]
- 13 **Lamagni TL**, Neal S, Keshishian C, Alhaddad N, George R, Duckworth G, Vuopio-Varkila J, Efstratiou A. Severe *Streptococcus pyogenes* infections, United Kingdom, 2003-2004. *Emerg Infect Dis* 2008; **14**: 202-209 [PMID: 18258111 DOI: 10.3201/eid1402.070888]
  - 14 **Stevens DL**, Tanner MH, Winship J, Swarts R, Ries KM, Schlievert PM, Kaplan E. Severe group A streptococcal infections associated with a toxic shock-like syndrome and scarlet fever toxin A. *N Engl J Med* 1989; **321**: 1-7 [PMID: 2659990 DOI: 10.1056/NEJM198907063210101]
  - 15 **Stevens DL**. Streptococcal toxic-shock syndrome: spectrum of disease, pathogenesis, and new concepts in treatment. *Emerg Infect Dis* 1995; **1**: 69-78 [PMID: 8903167 DOI: 10.3201/eid0103.950301]
  - 16 **Walker MJ**, Barnett TC, McArthur JD, Cole JN, Gillen CM, Henningham A, Sriprakash KS, Sanderson-Smith ML, Nizet V. Disease manifestations and pathogenic mechanisms of Group A *Streptococcus*. *Clin Microbiol Rev* 2014; **27**: 264-301 [PMID: 24696436 DOI: 10.1128/CMR.00101-13]
  - 17 **Commons RJ**, Smeesters PR, Proft T, Fraser JD, Robins-Browne R, Curtis N. Streptococcal superantigens: categorization and clinical associations. *Trends Mol Med* 2014; **20**: 48-62 [PMID: 24210845 DOI: 10.1016/j.molmed.2013.10.004]
  - 18 **Lamagni TL**, Darenberg J, Luca-Harari B, Siljander T, Efstratiou A, Henriques-Normark B, Vuopio-Varkila J, Bouvet A, Creti R, Ekelund K, Koliou M, Reinert RR, Stathi A, Strakova L, Ungureanu V, Schalén C; Strep-EURO Study Group, Jasir A. Epidemiology of severe *Streptococcus pyogenes* disease in Europe. *J Clin Microbiol* 2008; **46**: 2359-2367 [PMID: 18463210 DOI: 10.1128/JCM.00422-08]
  - 19 **de Paula PR**, Speranzini MB, Hamzagic HC, Bassi DG, Chacon-Silva MA, Novo NF, Goldenberg S. Bacteriology of the anal wound after open hemorrhoidectomy. Qualitative and quantitative analysis. *Dis Colon Rectum* 1991; **34**: 664-669 [PMID: 1855423 DOI: 10.1007/BF02050347]
  - 20 **Chen JS**, You JF. Current status of surgical treatment for hemorrhoids--systematic review and meta-analysis. *Chang Gung Med J* 2010; **33**: 488-500 [PMID: 20979699]
  - 21 **Nelson DW**, Champagne BJ, Rivadeneira DE, Davis BR, Maykel JA, Ross HM, Johnson EK, Steele SR. Prophylactic antibiotics for hemorrhoidectomy: are they really needed? *Dis Colon Rectum* 2014; **57**: 365-369 [PMID: 24509461 DOI: 10.1097/DCR.0b013e3182a0e522]
  - 22 **Brook I**, Frazier EH. Aerobic and anaerobic microbiology of infected hemorrhoids. *Am J Gastroenterol* 1996; **91**: 333-335 [PMID: 8607502]



Published by **Baishideng Publishing Group Inc**  
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA

**Telephone:** +1-925-3991568

**E-mail:** [bpgoffice@wjgnet.com](mailto:bpgoffice@wjgnet.com)

**Help Desk:** <https://www.f6publishing.com/helpdesk>

<https://www.wjgnet.com>

