

Post ablation bacteremia syndrome: an emerging clinical entity

Randy McCool, MD,¹ Sarah Shook, DO¹

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Abstract

Global endometrial ablation continues to be a frequent therapeutic option for abnormal uterine bleeding. Post ablation bacteremia, a rare clinical occurrence, provides diagnostic and treatment challenges for clinicians. We report a case of post ablation bacteremia from the vaginal flora bacterium Streptococcus anginosus. A definition of post ablation bacteremia syndrome (PABS) and its clinical implications are presented.

¹Northwest Community Hospital, 800 West Central Road, Arlington Heights, IL 60005

Introduction

Global endometrial ablation may introduce endogenous bacterial flora of the lower female reproductive tract into the bloodstream. Resultant infection may be local, regional, or systemic.¹ Pathogenicity of endogenous bacterial isolates may vary, effecting the clinical course and treatment of patients with post ablation bacteremia. Clinicians are reminded to consider distant abscess formation and metabolic responses to sepsis in such cases.²

Previously, the authors reported a case of post ablation bacteremia from *Gardnerella vaginalis* after use of intravenous sedation and paracervical block.³ We now report a second case of post ablation bacteremia from a different endogenous bacterium of the lower female reproductive tract. In this new case, *Streptococcus anginosus* was the isolated bacteremic agent. Adjustments in diagnostic testing and antibiotic treatment options were required during the patient's course of care. The authors propose that post ablation bacteremia syndrome is an emerging clinical entity of post-operative significance.

Case Report

A 40 year old, gravid 2, para 2 underwent diagnostic hysteroscopy, endometrial curettage, and endometrial ablation with Novasure device (Cytac, Marlborough, MA, USA) for refractory menorrhagia. Intravenous sedation and para-cervical block were used at the time of the outpatient procedures. Povidone-iodine solution was used to

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Corresponding author: Randy McCool, MD, 1630 West Central Road, Arlington Heights, ILL 60005, Telephone: 847-394-3553; Fax: 847-394-3574; E-mail: mccoolr3@yahoo.com

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prepare the vagina and perineum. Sterile technique was maintained throughout the case. No immediate post-operative complications were reported. Perioperative antibiotics were not indicated. Endometrial curettings from the time of surgery showed benign secretory type endometrium. The patient's history was negative for known tubal disease or a history of pelvic inflammatory disease, and no infectious symptoms were reported prior to the procedure. Preoperative pap, endometrial biopsy, and ultrasound were unremarkable for pathologic findings.

The patient presented to the hospital emergency department two days after her procedures with complaints of fever to 100°F and chills which began that same day. She denied abdominal pain, vaginal bleeding, or dysuria. Her initial temperature was 98.8°F (37.1° C). She was normotensive with a respiratory rate of 20. On examination the abdomen was soft, non-tender, non-distended, and without guarding, rebound or liver edge tenderness. Upon insertion of a speculum into the vagina a strong fishy odor was encountered and purulent discharge was noted at the cervical os. Aerobic and anaerobic endocervical cultures were obtained. On bimanual examination, the cervix and uterus were mildly tender. The adnexae were non tender and without masses.

Laboratory findings included a white blood cell count of 8,400 cells/mm³, neutrophils 91%, lymphocytes 3.6%, monocytes 4.8%, hemoglobin 11.9 g/dL, platelets 129,000/uL, blood urea nitrogen 13 mg/dL, and serum creatinine 0.77 mg/dL. Blood cultures x 2 sites and urine cultures were obtained.

Vaginal ultrasound of the pelvis showed a 9.9 cm x 5.7 cm x 4.8 cm uterus. The endometrium measured 5 mm endometrium. Fluid and heterogenous debris were noted within the endometrial cavity. Both ovaries were normal and no adnexal masses were seen. The patient was admitted for postoperative endometritis and begun on intravenous ampicillin-sulbactam. Due to malodor of the vagina, intravenous metronidazole was also initiated.

The patient was afebrile within 48 hours of admission and remained afebrile and normotensive for the remainder of her hospital stay. However, on the third hospital day she complained of bloating, decreased appetite and lower abdominal pain. Laboratory tests (complete blood count, complete metabolic profile, coagulation profile) and a CT of the abdomen and pelvis were ordered given her new symptoms. Additionally, that same day, culture results returned identifying *Streptococcus anginosus* on aerobic endocervical culture and *Bacteroides sp* not *fragilis* group on anaerobic endocervical culture. Furthermore, *Streptococcus anginosus* was isolated by polymerase chain reaction from both blood cultures samples obtained at the time of admission. Urine cultures were negative for growth. After identification of *Streptococcus anginosus* as the bacteremic agent, intravenous ampicillin-sulbactam was continued and the intravenous metronidazole was discontinued.

Subsequent laboratory tests on day 3 were significant for a white blood cell count of 5,000 cells/m³, hemoglobin 10.9 g/dL, platelets 88,000/uL. A normal complete metabolic profile and

coagulation profile were noted. A markedly thickened endometrium was noted on CT examination, with no intra-abdominal or intra-pelvic abscesses, retroperitoneal adenopathy, or intra-peritoneal free fluid noted. *Clostridium difficile* toxin assay was negative. Her symptoms readily resolved on day 4. The patient was discharged home on intravenous ceftriaxone daily for seven days on outpatient basis. Her recovery after discharge was uneventful.

Discussion

Global endometrial ablation is a cost effective outpatient/office procedure for abnormal uterine bleeding.⁴ Often performed under local or para-cervical block and/or intravenous sedation, it continues to be a popular therapeutic option for both patients and physicians. Post ablation infectious complications are rare, and may include local (endometritis, endomyometritis), regional (pelvic, intra- abdominal), or distant (brain, liver, lung) sites. Bacteremia from endogenous flora of the lower female reproductive tract after endometrial ablation has been reported from mono or poly microbial isolates, including *Staphylococcus aureus*, *Escherichia coli*, *Clostridium perfringens*, *Gardnerella vaginalis*, *Granulicatella adiacens*, *Streptococcus agalactiae*, *Bacteroides fragilis*, and gram negative bacillus not *Bacteroides fragilis*.¹

Preoperative antibiotic prophylaxis for global endometrial ablation is generally not recommended by The American College of Obstetricians and Gynecologists (ACOG), unless the patient has a prior history of tubal disease, pelvic inflammatory disease, or

suspected active infection at the time of the procedure.⁵

In our case, *Streptococcus anginosus* was isolated from endocervical and blood culture studies obtained at admission. This bacterium is a gram positive, non-motile facultative anaerobe classified as a sub group of *Streptococcus viridans*.⁶ First identified from a dental abscess in 1956, this bacterium is regarded to be an endogenous flora of oral, intestinal, and vaginal tract sites.⁷ In vitro cultures demonstrate a characteristic caramel or butterscotch odor with potentiated growth in the presence of acidic environments and other bacteria.^{8,9}

Streptococcus anginosus infections are associated with abscess formation due to production of hydrolytic enzymes and an outer capsule that favors attachment to damaged host tissues which also resists phagocytosis by cells of the host's immune system.^{8,9} Primary or secondary entry of *Streptococcus anginosus* into the bloodstream after endometrial ablation may occur after destruction of the endometrial barrier or by direct inoculation from para-cervical block. Treatment options include penicillin, clindamycin, erythromycin, vancomycin, or cephalosporin antibiotics.⁸

Post-operative infection may evoke an inflammatory response in the host, including fever, hypothermia, tachycardia, tachypnea, or a change in blood leukocyte count. Systemic inflammatory response syndrome (SIRS) is identified when two or more of those criteria occur in the presence of host infection. Progression of infection in the host may lead to sepsis, severe

sepsis, or septic shock. The continuum from sepsis to septic shock increases the risk of mortality.^{10,11} Although many cases of patients presenting with SIRS may not progress into sepsis or its sequela, patients presenting with SIRS have a 3.7 times higher proportion of bacteremia and 6.9 times higher risk for 28 day mortality than patients who do not have SIRS related findings.¹⁰

Post ablation bacteremia syndrome is a rare postoperative infection involving entry of vaginal flora bacteria into the bloodstream after global endometrial ablation. As with SIRS and with PABS specifically, presenting symptoms include fever, chills, malodorous vaginal discharge, or lower abdominal-pelvic pain occurring days to weeks after surgery. Clinical signs include fever, vaginal or cervical discharge, or cervical, uterine, adnexal, or generalized lower abdominal-pelvic tenderness. Diagnosis of post-operative bacteremia is confirmed by identification of one or more endogenous floral bacteria from blood culture. Varied degrees of leukocytosis, thrombocytopenia, or left white blood cell shift may be noted. CT and ultrasound findings may demonstrate endometrial fluid with debris, or abdominal-pelvic abscess.

Empiric parenteral antibiotics for patients presenting with post ablation bacteremia infection include a combination of broad spectrum antibiotics such as clindamycin (900 mg every 8 hours) or metronidazole (500 mg every 12 hours) plus penicillin (5 million units every 6 hours) or ampicillin (2 grams every 6 hours) plus gentamycin (5 mg/kg ideal body weight every 24 hours). Aztreonam (2 grams every 8 hours) may be substituted for

gentamycin in renal impaired patients. Alternative single agent antibiotics with extended antimicrobial coverage may also be considered, including extended spectrum cephalosporins (cefoxitin, cefotetan, cefotaxime, and ceftizoxime), extended spectrum penicillin (piperacillin-tazobactam), beta-lactamase inhibitors plus a beta-lactam (ticarcillin-clavulanate), and carbapenems (ertapenem or meropenem).¹²

Ongoing patient assessment during treatment of post ablation bacteremia syndrome is essential during the treatment phase as distal site infections or abscesses may occur. Initiation of broad spectrum antibiotics may require modification after specific bacteremic agents are identified. Refractory sites of local or distal infection may require surgical abscess drainage or surgical removal of involved organs.

PABS is rarely encountered in routine clinical practice, however its occurrence is garnering increasing reports in the medical literature.^{1,2} Progression from post-surgical bacteremia, as in PABS, to sepsis, severe sepsis, or septic shock may be impeded by early recognition and parenteral broad spectrum antibiotic treatment and should be a recognized clinical entity by gynecologic surgeons performing endometrial ablation.

As global endometrial ablations continue to increase in volume, it is anticipated that clinicians will likely encounter this rare infectious disorder.

References

1. Divoky LE, Myers JP. Bacteremia associated with endometrial ablation: report of 2 cases and review of the literature. *Infectious Diseases in Clinical Practice*. 2014 Nov; 22(6): 309-311. <https://doi.org/10.1097/IPC.00000000000000175>
2. Sharp HT. Endometrial ablation: postoperative complications. *Am J Obstet Gynecol*. 2012 Oct;207(4):242-7. <https://doi.org/10.1016/j.ajog.2012.04.011> Epub 2012 Apr 6. PubMed PMID: 22541856.
3. McCool RA, DeDonato DM. Bacteremia of *Gardnerella vaginalis* after endometrial ablation. *Arch Gynecol Obstet*. 2012 Nov;286(5):1337-8. <https://doi.org/10.1007/s00404-012-2447-7> Epub 2012 Jul 3. PubMed PMID: 22752597.
4. Woods S, Taylor B. Global ablation techniques. *Obstet Gynecol Clin North Am*. 2013 Dec;40(4):687-95. <https://doi.org/10.1016/j.ogc.2013.09.001> PubMed PMID: 24286996.
5. ACOG Committee on Practice Bulletins-Gynecology. ACOG practice bulletin No. 104: antibiotic prophylaxis for gynecologic procedures. *Obstet Gynecol*. 2009 May;113(5):1180-9. <https://doi.org/10.1097/AOG.0b013e3181a6d011> PubMed PMID: 19384149.
6. Spellerberg B, Brandt C. Streptococcus. In: Murray PR, Baron EJ, Jorgensen JH, Landry ML, Pfaller MA, Editors. *Manual of Clinical Microbiology*, 2 Volume set. Washington, DC: American Society of Microbiology; 9th ed., 2007. Volume 1, p. 412-429.
7. Shaukat A, Al Saub H, Al Maslamani M, Chako K, Abu Khattab M, Hasham S, Howaidy F, Al Deeb Y, Deshmukh A, Mahmoud M, Abraham M, Latif Al Khal A. Streptococcus anginosus infections; Clinical and bacteriologic characteristics, A 6-year retrospective study of adult patients in Qatar. *Infect Dis Clin Pract* 2016 Mar;24(2):92-95. <https://doi.org/10.1097/IPC.00000000000000318>
8. Yilmaz H, Yilmaz EM, Karadag A, Esen S, Sunbul M, Leblebicioglu H. Liver abscess associated with an oral flora bacterium *Streptococcus anginosus*. *Journal of Microbiology and Infectious Diseases*. 2012;2(1):33-35. <https://doi.org/10.5799/ahinjs.02.2012.01.0039>
9. Gray T. Streptococcus anginosus group: Clinical significance of an important group of pathogens. *Clinical Microbiology Newsletter*. 2005;27(20):155-159. <https://doi.org/10.1016/j.clinmicnews.2005.09.006>
10. Comstedt P, Storgaard M, Lassen AT. The Systemic Inflammatory Response Syndrome (SIRS) in acutely hospitalised medical patients: a cohort study. *Scand J Trauma Resusc Emerg Med*. 2009 Dec 27;17:67. <https://doi.org/10.1186/1757-7241-17-67> PubMed PMID: 20035633; PubMed Central PMCID: PMC2806258.
11. Singer M, Deutschman CS, Seymour CW, Shankar-Hari M, Annane D, Bauer M, Bellomo R, Bernard GR, Chiche JD, Cooper-Smith CM, Hotchkiss RS, Levy MM, Marshall JC, Martin GS, Opal SM, Rubenfeld GD, van der Poll T, Vincent JL, Angus DC. The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). *JAMA*. 2016 Feb 23;315(8):801-10. doi: 10.1001/jama.2016.0287. PubMed PMID: 26903338; PubMed Central PMCID: PMC4968574.

12. Lachiewicz MP, Moulton LJ, Jaiyeoba O. Pelvic surgical site infections in gynecologic surgery. *Infect Dis Obstet Gynecol.* 2015;2015:614950. <https://doi.org/10.1155/2015/614950>
Epub 2015 Feb 18. PubMed PMID: 25788822; PubMed Central PMCID: PMC4348594.