

Multicenter Investigation of the Micro-Organisms Involved in Penile Prosthesis Infection: An Analysis of the Efficacy of the AUA and EAU Guidelines for Penile Prosthesis Prophylaxis

Martin S. Gross, MD,¹ Elizabeth A. Phillips, MD,² Robert J. Carrasquillo, MD,² Amanda Thornton, MD,² Jason M. Greenfield, MD,³ Laurence A. Levine, MD,⁴ Joseph P. Alukal, MD,⁵ William P. Connors III, MD,⁶ Sidney Glina, MD,⁷ Cigdem Tanrikut, MD,⁸ Stanton C. Honig, MD,⁹ Edgardo F. Becher, MD,¹⁰ Nelson E. Bennett, MD,¹¹ Run Wang, MD,¹² Paul E. Perito, MD,¹³ Peter J. Stahl, MD,¹⁴ Mariano Rosselló Gayá, MD,¹⁵ Mariano Rosselló Barbará, MD,¹⁵ Juan D. Cedenó, MD,¹⁶ Edward L. Gheiler, MD,¹⁶ Odunayo Kalejaiye, MBBS,¹⁷ David J. Ralph, BSc MS,¹⁷ Tobias S. Köhler, MD,¹⁸ Doron S. Stember, MD,¹⁹ Rafael E. Carrion, MD,²⁰ Pedro P. Maria, DO,²¹ William O. Brant, MD,²² Michael W. Bickell, DO,²³ Bruce B. Garber, MD,²³ Miguel Pineda, MD,²⁴ Arthur L. Burnett II, MD, MBA,²⁴ J. Francois Eid, MD,²⁵ Gerard D. Henry, MD,²⁶ and Ricardo M. Munarriz, MD²

ABSTRACT

Introduction: Penile prosthesis infections remain challenging despite advancements in surgical technique, device improvements, and adoption of antibiotic prophylaxis guidelines.

Aim: To investigate penile prosthesis infection microbiology to consider which changes in practice could decrease infection rates, to evaluate current antibiotic prophylaxis guidelines, and to develop a proposed algorithm for penile prosthesis infections.

Methods: This retrospective institutional review board–exempt multi-institutional study from 25 centers reviewed intraoperative cultures obtained at explantation or Mulcahy salvage of infected three-piece inflatable penile prostheses (IPPs). Antibiotic usage was recorded at implantation, admission for infection, and explantation or salvage surgery. Cultures were obtained from purulent material in the implant space and from the biofilm on the device.

Main Outcome Measures: Intraoperative culture data from infected IPPs.

Results: Two hundred twenty-seven intraoperative cultures (2002–2016) were obtained at salvage or explantation. No culture growth occurred in 33% of cases and gram-positive and gram-negative organisms were found in 73% and 39% of positive cultures, respectively. *Candida* species (11.1%), anaerobes (10.5%) and methicillin-resistant *Staphylococcus aureus* (9.2%) constituted nearly one third of 153 positive cultures. Multi-organism infections occurred in 25% of positive cultures. Antibiotic regimens at initial implantation were generally consistent with American Urological Association (AUA) and European Association of Urology (EAU)

Received October 16, 2016. Accepted January 3, 2017.

¹Dartmouth-Hitchcock Medical Center, Lebanon, NH, USA;

²Boston University Medical Center, Boston, MA, USA;

³Urology Associates of North Texas, Grapevine, TX, USA;

⁴Rush Medical College, Chicago, IL, USA;

⁵NYU Langone Medical Center, New York, NY, USA;

⁶Beth Israel Deaconess Medical Center, Boston, MA, USA;

⁷Faculdade de Medicina do ABC/Instituto H. Ellis, Bela Vista, SP, Brazil;

⁸Massachusetts General Hospital, Boston, MA, USA;

⁹Yale School of Medicine, New Haven, CT, USA;

¹⁰University of Buenos Aires, Buenos Aires, Argentina;

¹¹Lahey Hospital and Medical Center, Burlington, MA, USA;

¹²The University of Texas Health Science Center at Houston, Houston, TX, USA;

¹³Perito Urology, Coral Gables, FL, USA;

¹⁴Columbia University College of Physicians & Surgeons, New York, NY, USA;

¹⁵Hospital Quirón Palmaplanas Salud, Palma, Illes Balears, Spain;

¹⁶Urology Specialists, Hialeah, FL, USA;

¹⁷University College London Hospital, London, UK;

¹⁸SIU School of Medicine, Springfield, IL, USA;

¹⁹Mount Sinai Hospital, New York, NY, USA;

²⁰USF Morsani College of Medicine, Tampa, FL, USA;

²¹Albert Einstein College of Medicine, Bronx, NY, USA;

²²University of Utah Hospital, Salt Lake City, UT, USA;

²³Hahnemann University Hospital, Philadelphia, PA, USA;

²⁴Johns Hopkins University School of Medicine, Baltimore, MD, USA;

²⁵Advanced Urological Care, New York, NY, USA;

²⁶Regional Urology, Shreveport, LA, USA

Copyright © 2017, International Society for Sexual Medicine. Published by Elsevier Inc. All rights reserved.

<http://dx.doi.org/10.1016/j.jsxm.2017.01.007>

guidelines. However, the micro-organisms identified in this study were covered by these guidelines in only 62% to 86% of cases. Antibiotic selection at admissions for infection and salvage or explantation varied widely compared with those at IPP implantation.

Conclusion: This study documents a high incidence of anaerobic, *Candida*, and methicillin-resistant *S aureus* infections. In addition, approximately one third of infected penile prosthesis cases had negative cultures. Micro-organisms identified in this study were not covered by the AUA and EAU antibiotic guidelines in at least 14% to 38% of cases. These findings suggest broadening antibiotic prophylaxis guidelines and creating a management algorithm for IPP infections might lower infection rates and improve salvage success. **Gross MS, Phillips EA, Carrasquillo RJ, et al. Multicenter Investigation of the Micro-Organisms Involved in Penile Prosthesis Infection: An Analysis of the Efficacy of the AUA and EAU Guidelines for Penile Prosthesis Prophylaxis. J Sex Med 2017;XX:XXX–XXX.**

Copyright © 2017, International Society for Sexual Medicine. Published by Elsevier Inc. All rights reserved.

Key Words: Penile Prosthesis; Infection; Bacteria; Antibiotic Prophylaxis

INTRODUCTION

Significant advances in infection prevention have occurred since the introduction of inflatable penile prostheses (IPPs). Experienced prosthetic surgeons have innovated and standardized the surgical technique for better care, as seen in a recent study of implanters' practices showing diverse strategies.¹ Less skin contact and shorter operative time have decreased the likelihood of device bacterial contamination.^{2,3} Other techniques have decreased hematoma formation, which in turn have decreased nutrient sources available to bacteria.^{4,5} American Urological Association (AUA) and European Association of Urology (EAU) guidelines for antibiotic selection have broadened perioperative prophylaxis to more appropriate agents for the bacteria expected to cause infection.^{6,7} Manufacturers have made device coating adaptations that lower infection rates.^{8–11}

Despite these advances, infection occurs in 1% to 3% of cases after new implantation and up to 10% of the time at penile prosthesis revision.^{10,12} The period for infection typically lasts up to 1 year after surgery and skin flora are the most commonly cultured organisms at the time of explantation or salvage.¹³ Clinically uninfected prostheses can have culture-positive biofilms with skin flora,¹⁴ so some cultured organisms might be inactive in healthy patients in the modern era of infection-retardant coatings. However, there has been an increasing incidence of infection with more virulent, antibiotic-resistant, and systemically invasive organisms.^{15,16}

A recent review of culture data obtained from multiple experienced prosthetic surgeons at salvage showed that many of the micro-organisms isolated were unusual and were not adequately covered by current antibiotic guidelines.¹⁷ The present multi-institutional study was designed to investigate the microbiology of penile prosthesis infections to better understand and potentially decrease infection rates and to evaluate current antibiotic prophylaxis guidelines. In addition, we applied our results to the development of a proposed management algorithm for infected IPPs.

METHODS

This is a retrospective study of 227 patients at 25 institutions who underwent salvage or explantation of three-piece IPPs from 2002 through 2016; this study was exempt from review by the institutional review board of Boston University School of Medicine (BUMC protocol H-33597; Boston, MA, USA). Antibiotic usage was recorded at implantation, admission for infection, and explantation or salvage surgery. Patient data were compiled after extensive review of all aspects of their electronic medical records.

Patients appropriate for a salvage procedure (ie, a clear source of scrotal or shaft infection on examination and/or at imaging) were included and offered Mulcahy salvage with a malleable or inflatable device.^{17,18} Patients with more extensive complications, including device erosion, visible necrosis, inability to tolerate extended surgery, or sepsis, underwent explantation. Infected implant spaces were cultured using culture swabs and/or 10-mL syringes, with transfer of purulent material into a sterile cup. In some cases, explanted devices were swabbed to obtain a biofilm sample. Salvage technique was consistent across sites and proceeded as outlined by Mulcahy. Collaborating author data were compiled into a database using Excel (Microsoft, Redmond, WA, USA), which also was used for statistical calculation and analysis.¹⁸

RESULTS

The malleable implant salvage technique was used in 76 cases (34%), standard three-piece IPP salvage was used in 66 cases (29%), and explantation was performed in 83 cases (37%). The exact procedure was unknown in the other two cases. Fifty-five patients (24%) had undergone multiple prior IPP surgeries (mean = 2.1, range = 1–9). The other 172 patients had undergone primary IPP implantation before presenting with infection. Three of these patients with primary implantation underwent simultaneous artificial urinary sphincter (AUS) implantation. Patients presented with infection approximately

Download English Version:

<https://daneshyari.com/en/article/5730529>

Download Persian Version:

<https://daneshyari.com/article/5730529>

[Daneshyari.com](https://daneshyari.com)