

ORIGINAL RESEARCH—SURGERY

Antibiotic Patterns with Inflatable Penile Prosthesis Insertion

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DOI: 10.1111/j.1743-6109.2011.02207.x

ABSTRACT

Introduction. A clear set of guidelines has not been defined in the use of antibiotics in penile prosthesis implantation.

Aim. We surveyed urologists throughout the United States to determine current practice patterns regarding antibiotic use in primary and revision penile prosthesis surgery.

Methods. Fifty-two Sexual Medicine Society of North America (SMS) member urologist and 164 non-SMS member urologist responses were obtained.

Main Outcome Measures. The survey contained 10 questions regarding antibiotic selection for primary and revision inflatable penile prosthesis (IPP) implantation.

Results. One hundred percent of responders in both groups utilize intraoperative antibiotics, most commonly vancomycin and gentamicin in both groups. Of SMS members, 94% prescribed postoperative home oral antibiotics in contrast to 88% of non-SMS members ($P = 0.3$). Among SMS members, the most common antibiotic prescribed postoperatively was levofloxacin 500 mg daily while among non-SMS members, the most common antibiotic postoperatively was cephalexin 500 mg 2–4 times daily. Of SMS members, antibiotic irrigation intraoperatively occurred with 100% and with 92% of non-SMS members ($P = 0.04$). Thirty-seven percent SMS physicians and 15% non-SMS physicians made modifications of intraoperative and postoperative antibiotics for high-risk patients ($P = 0.001$). In the circumstance of revision of a clinically noninfected IPP, 23% SMS and 16% non-SMS member physicians utilized additional antibiotics/treatment ($P = 0.3$). Sixteen of those surveyed admitted that they had been approached by their institution about their antibiotic use and asked to change. In the past 5 years, 29% surveyed have changed their practice patterns in antibiotic use.

Conclusions. There is significant difference between practice patterns of SMS and non-SMS urologists in terms of antibiotic irrigation usage, modifications for high-risk patients, and consensus about the importance of antibiotic use with Coloplast Titan implant (Coloplast, Minneapolis, MN, USA). A significant lack of uniformity exists among urologists performing prosthetic surgery with regard to antibiotic protocols. A standard set of guidelines may prove useful to implanters. **Wosnitzer MS and Greenfield JM. Antibiotic patterns with inflatable penile prosthesis insertion. J Sex Med 2011;8:1521–1528.**

Key Words. Inflatable Penile Prosthesis; Antibiotic Selection; Infection; Erectile Dysfunction; Survey of Urologic Practice in Preventing Penile Implant Infections

Introduction

There has been mechanical improvement of the inflatable penile prosthesis (IPP) during the past 30 years of availability [1–3], including guidelines for optimal patient management [4]. Associated infection rates have been low but remain a consistent issue without a clear set of guidelines in the postoperative and revision settings. Infection

incidence ranges between 0.6% and 8.9%, with increased rates in revision or reimplantation cases up to 13% [5,6]. Risk of infection is associated with bacterial colonization at the time of implantation [7] and patient history of diabetes mellitus, spinal cord injury, urinary tract infection, immunosuppression, neurogenic bladder, or ileal conduit as well as with inadequate perioperative prophylaxis, violations of sterile protocol, prolonged

hospitalization, prolonged operative time, repeat implantations, or combination of any other surgical procedure with prosthesis implantation [8–14]. Newer strategies for lowering infections in the prosthesis recipient have focused on altering surface properties of the implant to affect biofilm, an organized bacterial colony growing on the implanted material surface typically exhibiting antibiotic resistance [15]. Bacteria accumulate on surgically introduced biomaterials and their extracellular products adhere to form a conditioning film on the prosthesis, with hydrophobicity and surface charge being critical to bacterial adherence [16].

The use of prophylactic perioperative intravenous antibiotics during implantation of prosthetic devices is widely accepted, with combination therapy including glycopeptide or cephalosporin antibiotics for gram-positive coverage and aminoglycosides for gram-negative coverage [17,18]. Antibiotics should be present with peak blood levels at the time of incision [19]. The use of antibiotic irrigation solution has also been recommended [13,18] and is a major component of the salvage procedure [20,21]. The AMS 700™ device (American Medical Systems, Minnetonka, MN, USA), precoated with InhibiZone (minocycline and rifampin [AMS, American Medical Systems]) and introduced in 2001, has been recognized to elute impregnated antibiotics for 7 to 10 days [22]. The AMS prosthesis has been shown to reduce infection in virgin, diabetic and nondiabetic patients, with the use of adjunctive antiseptic solution in revision surgery shown to be beneficial [11,23–25]. Similarly, the hydrophilic polyvinylpyrrolidone (PVP) coating of the Titan™ (Coloplast), introduced in 2002, which absorbs and elutes the antibiotic solution in which it is soaked, decreases the infection rate (1.06% of 2,357 patients) during primary implantation surgery [12,26]. Both implant types share a similar design with a fluid reservoir in the perivesical space, a pair of cylinders for intracavernosal implantation, a scrotal pump for fluid transfer between reservoir and cylinders, and silicone tubing for connection of components.

The American Urologic Association (AUA) guidelines regarding IPP insertion (1996) and the antibiotic prophylaxis guidelines (2008) recommend prophylactic broad-spectrum gram-negative and gram-positive coverage intraoperatively to promote implant survival. Gram-positive organisms, commonly *Staphylococcus epidermidis* (in up to 80% of infections), and gram-negative enteric organisms (including *Proteus aeruginosa*, *Escherichia*

coli, and *Serratia marcescens*) are most frequently implicated (20% of infections) [27]. Infection most frequently occurs during the first 3 months following implantation [7], with the majority occurring within 12 months of implantation. Later infections may be secondary to hematogenous spread or reemergence of bacteria previously embedded in biofilm [13]. Frequently used agents include cephalosporins (first or second generation), aminoglycosides, aztreonam, and vancomycin typically for 24 hours. Fluoroquinolones were also previously recommended, but are less desirable due to increasing resistance and poor gram-positive coverage for certain members of this class.

Aims

No official guidelines are available regarding postoperative oral antibiotic regimen, duration, antibiotic use for high-risk patients, revision of noninfected or infected prostheses, although evidence for revision antibiotic washout has been demonstrated in infectious and noninfectious settings [20,28]. There are also no official recommendations for specific perioperative intravenous or irrigation antibiotics to be used for different implants with varying properties. We have therefore surveyed urologists throughout the United States to determine current practice patterns with choice of IPP model and antibiotic use in primary and revision IPP placement.

Methods

We conducted a survey of urologists, including members of the Sexual Medicine Society of North America (SMS) and non-SMS members, by mailed questionnaire from January 2009 through May 2009 to practicing SMS-member urologists and non-SMS members who specialize in IPP implantation in the United States to determine current practice patterns. Five hundred four surveys were mailed to SMS urologists and 1,464 surveys were mailed to non-SMS urologists. Fifty-two SMS-member urologists and 164 non-SMS member urologist responses were obtained (10% and 11% response rates, respectively).

Main Outcome Measures

The survey included 10 questions regarding intraoperative antibiotic selection for primary IPP implantation with either the Titan™ or AMS 700™ device, postoperative antibiotic choice and

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