

Delayed Postoperative Hematoma Formation after Inflatable Penile Prosthesis Implantation

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ABSTRACT

Introduction. Infrequent but serious postoperative complications following inflatable penile prosthesis (IPP) insertion include infection, malfunction, and bleeding. Although prior publications report methods to reduce immediate postoperative bleeding, there is little in the literature concerning the etiology, diagnosis, imaging, and management of delayed bleeding after IPP insertion.

Aim. The aim of the study was to review cases of delayed postoperative bleeding following IPP insertion in a large single-surgeon series.

Methods. We carried out a retrospective chart review of 600 patients implanted with a Coloplast Titan IPP with One-Touch Release pump by a single surgeon, and analyzed cases of delayed postoperative bleeding.

Main Outcome Measure. The main outcome measure was an analysis of the incidence, causes, diagnostic methods, treatment, and final outcome of these cases.

Results. Three out of 600 consecutive patients (0.5%) developed a delayed (defined as >5 days postoperative) hematoma following IPP insertion. All patients presented postoperatively with a swollen surgical site, and all were evaluated with a pelvic computed tomography scan to completely define the extent of the hematoma. Two patients developed a delayed hematoma because of excessive physical activity; the remaining patient bled because of premature administration of enoxaparin sodium (Lovenox) by his cardiologist. All three patients were successfully treated with hospital admission, intravenous antibiotics, wound exploration, hematoma evacuation, and antibiotic washout. All three IPPs were successfully salvaged; none developed peri-prosthetic infection.

Conclusions. The incidence of delayed postoperative hematoma following IPP surgery was 0.5% in our series of 600 cases. All cases were successfully managed with intravenous antibiotics, hematoma evacuation, and antibiotic washout. Because of the low incidence of this complication, definitive statements concerning prevention and management cannot be made. However, we now recommend avoiding postoperative anticoagulants for at least 5 days if possible, and avoiding vigorous physical activity for at least 3 weeks. **Garber BB and Bickell M. Delayed postoperative hematoma formation after inflatable penile prosthesis implantation. J Sex Med 2015;12:265–269.**

Key Words. Inflatable Penile Prosthesis; Penile Prosthesis Complications; Penile Prosthesis Hematoma

Introduction

Erectile dysfunction (ED) affects more than 30 million American men, according to estimates by the National Institutes of Health [1]. When conservative measures such as phosphodiesterase type 5 (PDE5) inhibitors, intra-urethral or intra-cavernosal alprostadil, and vacuum con-

striction devices fail, a penile prosthesis may be considered. The best flaccidity and rigidity as well as patient satisfaction outcomes are achieved with a multiple-component inflatable penile prosthesis (IPP) [2]. IPP construction and implantation techniques have undergone many improvements over the years [3–8]. However, the devices and surgical techniques still occasionally result in post-

operative complications. Infrequent but serious adverse events following IPP surgery include peri-prosthetic infection, device malfunction, and postoperative bleeding. Bleeding complications may occur immediately after surgery, or may be delayed several days to weeks following surgery. The rate of immediate postoperative hematoma formation varies depending on the operative techniques used, the presence of a closed suction drain (CSD), use of a pressure dressing, and device inflation. In one large series, the immediate postoperative hematoma rate was 2.9% when a drain was not used, but decreased to 0.9% with a pressure dressing, a CSD, and partial device inflation [9]. Immediate postoperative hematoma following IPP insertion may be due to non-watertight corporotomy closure, as well as bleeding from other areas in the surgical field. There are a number of publications concerning the etiology, incidence, and treatment of immediate postoperative hematomas after IPP surgery, with a particular focus on the benefits and drawbacks of CSD placement and postoperative dressing techniques [8–12]. However, there is a paucity of literature concerning delayed bleeding after IPP insertion.

Aim

The aim of this study was to review the etiology, diagnosis, imaging, and management of patients who developed a delayed postoperative hematoma in a large single-surgeon series of patients who were implanted with a Coloplast Titan IPP (North Mankato, MN, USA) with One-Touch Release (OTR) pump.

Methods

We carried out a retrospective chart review of 600 consecutive patients who were implanted with a Coloplast Titan IPP with an OTR pump. Primary and revision cases were included; patients who were implanted with the previously available Genesis pump, or the new Touch pump, were excluded. All patients had a normal prothrombin time, activated partial thromboplastin time, and platelet count at the time of surgery. Implantation was performed via a scrotal, infrapubic, or combined approach depending on the patient's body habitus, prior surgical history, and surgeon preference. A dedicated high-volume implant surgeon at a single institution performed all procedures. All patients received preoperative intravenous gentamicin and vancomycin, and all IPP components were soaked in antibiotic irrigation (rifampin and

gentamicin, 1 mg of each per milliliter) just prior to implantation. Watertight corporotomy closure was carried out in all cases with preplaced horizontal mattress sutures. All patients had a 10-French CSD and a Foley catheter placed at the time of surgery; both were removed on postoperative day #1. No compression dressing of any type was used, but all devices were left partially inflated. All patients were given written postoperative instructions, instructing them to avoid any heavy physical activity for 3 weeks. No patient developed an immediate postoperative hematoma. Three patients (0.5%) developed a delayed postoperative hematoma requiring a post operative intervention under general anesthesia, (a Clavien Grade IIIb complication), and are the subject of this review.

Results

Patient #1

E.J. was a 50-year-old male with refractory ED related to a 30-pack year history of cigarette smoking. Penile duplex Doppler ultrasonography revealed bilateral cavernous artery insufficiency. Treatment with PDE5 inhibitors and intracavernous alprostadil was unsuccessful, and he subsequently underwent IPP insertion via a transverse infrapubic approach. On postoperative day #1, his CSD and Foley catheter were removed. Exam at that time revealed negligible swelling; the CSD had drained <50 cc. On postoperative day #9, he reported sudden onset of infrapubic pain, swelling, and drainage from his incision. He admitted to resuming his exercise regimen of walking 4 miles per day, despite explicit written instructions for light activity during the first three postoperative weeks. Exam at that point revealed a hematoma underneath his incision, with bloody drainage (Figure 1). There were no overt findings of infection. Pelvic computed tomography (CT) scan revealed a hematoma confined to the area under the incision (Figure 2). All implant components were in their expected position, and the bladder was intact. He was admitted and placed on intravenous vancomycin and gentamicin. His coagulation parameters were all normal. He was taken to the operating room and underwent wound exploration, hematoma evacuation, washout with antibiotic irrigation (rifampin and gentamicin, 1 mg of each per milliliter), and placement of a CSD. No active bleeding was identified at that time. His CSD was removed the following day, and he was discharged. His device healed uneventfully thereafter, and provided a good erectile result (Figure 3).



Figure 1 Patient #1. Infrapubic wound is swollen, with bloody drainage.



Figure 2 Computed tomography (CT) scan of Patient #1 reveals hematoma subjacent to incision.

Patient #2

N.B. was a 59-year-old male with refractory vasculogenic ED related to a 62-year pack history of cigarette smoking. He underwent IPP insertion via a transverse infrapubic approach. On postoperative day #1, his CSD and Foley catheter were removed. Exam revealed negligible swelling; the CSD had drained <50 cc. Two weeks following the procedure, he returned to work and lifted some heavy objects, whereupon he developed pain, swelling, ecchymosis, and bloody drainage from his incision. Exam at that point was consistent with a hematoma under his incision. His treatment was identical to that of Patient #1. Pelvic CT scan revealed a confined hematoma under the incision, and he was taken to the operating room for wound exploration, hematoma evacuation, antibi-

otic washout, and CSD placement. His follow-up mirrored that of Patient #1; the implant healed uneventfully thereafter.

Patient #3

A.S. was an 80-year-old male with multiple comorbidities including morbid obesity, atrial fibrillation requiring anticoagulation with warfarin sodium, congestive heart failure, and a history of prostate cancer treated with brachytherapy. Because of refractory organic ED, he elected IPP insertion. Pursuant to his cardiologist's recommendation, his warfarin was held 7 days preoperatively. He was started on daily enoxaparin injections, with his last injection being administered the day prior to his implant. His prothrombin time was normal on the morning of his procedure. He underwent IPP insertion via a scrotal incision, but a suprapubic counter-incision was required for safe reservoir placement. On postoperative day #1, exam revealed negligible swelling; the CSD had drained <50 cc. His CSD and Foley catheter were removed. Again following cardiology recommendations, he was restarted on his enoxaparin injections and warfarin on postoperative day #3. He then presented to the emergency room on postoperative day #7 with a 7.5-cm scrotal hematoma, documented via scrotal ultrasonography. At that point, his scrotal incision was intact with no bloody drainage. His International Normalized Ratio (INR) was 1.29; pelvic CT scan revealed the hematoma was confined to his scrotum. He was admitted and conservative management was attempted. He was placed on intravenous antibiotics; his enoxaparin and warfarin were held, scrotal elevation and ice packs were



Figure 3 Final healed result of Patient #1.

employed, and he was subsequently discharged with oral antibiotics. However, several days later, he developed bloody drainage from his scrotal incision; he returned to the emergency room, and then underwent scrotal wound exploration, hematoma evacuation, washout with antibiotic irrigation, and placement of a CSD via the most superior aspect of the scrotum. Of note, his abdominal counter-incision showed no sign of hematoma and did not require surgical intervention. His device healed up uneventfully thereafter.

Discussion

The primary objective for management of any post-IPP hematoma is to salvage the prosthesis and minimize the risk of infection and other morbidity. The three cases we present highlight the infrequent occurrence of delayed postoperative hematoma following IPP insertion and illustrate relevant treatment options, which include conservative management and definitive surgical treatment.

The majority of postoperative hematomas are recognized in the first few days, and can be managed conservatively with scrotal elevation, ice packs, compressive dressings, and antibiotics [12]. In one large series, the rate of immediate postoperative hematoma following IPP insertion decreased to 0.9% when a combination of pressure dressing, CSD placement, and partial inflation of prosthesis was employed [9]. More recent studies have documented an immediate postoperative hematoma rate of 0.7% following IPP insertion [11]. Our literature search revealed virtually no published data concerning *delayed* hematoma formation after IPP insertion. Our series of 600 cases revealed a 0.5% incidence of delayed hematoma formation. The two etiologies that we identified

were (i) excessive physical activity and (ii) premature use of anticoagulants. Hematoma formation following penile implant surgery has been shown to lead to increased postoperative pain and a prolonged convalescence [9,11]. A significant correlation between hematoma formation and perioperative wound complications has been documented after orthopedic implant procedures [13,14]. A review of one surgeon's database of over 4,000 IPP procedures documented an infection rate of 17% when hematomas were incised and drained postoperatively [11]. We found no published algorithm or protocol in the field of implant surgery, including urologic, plastic, or orthopedic surgery, to advise when to perform surgical drainage, vs. a trial of conservative therapy for the management of a delayed postoperative hematoma. In all three of our patients, we chose surgical drainage as our treatment modality because their incisions were open and draining blood. It was our opinion that this scenario would make subsequent device infection a near-certainty. Intra-operative wound cultures from our three patients were negative; all were receiving intravenous antibiotics. We initially attempted conservative measures on Patient #3, as his incision was closed when he first presented. However, his incision subsequently opened and began draining blood, prompting definitive surgical intervention. Because of their infrequent occurrence, there are no prospective, randomized controlled trials comparing surgical drainage vs. conservative treatment of delayed postoperative implant hematomas. We have proposed a treatment algorithm for the management of delayed postoperative hematomas following IPP insertion to establish a suggested approach to minimize the incidence of infection and preserve function of the implant (Figure 4).

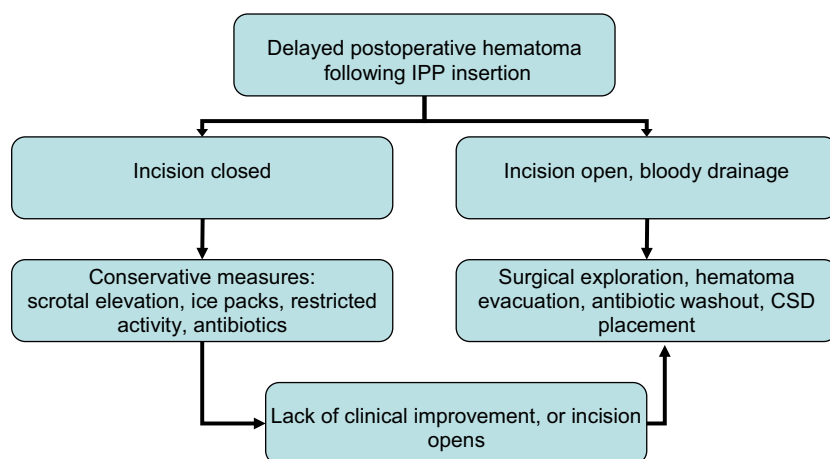


Figure 4 Algorithm for management of delayed hematoma after inflatable penile prosthesis (IPP) insertion. CSD = closed suction drain.

Conclusions

Our series of 600 patients implanted with a Coloplast Titan IPP with an OTR pump revealed a delayed hematoma formation rate of 0.5% (three patients). All presented with acute swelling of the surgical site, in the absence of signs of infection, and all hematomas were clearly documented via CT scan. The two causative factors in these patients were excessive physical activity and early use of anticoagulants. If the surgical incision is intact, then conservative management may be attempted. If the incision is open and draining blood, then it may be possible to successfully salvage the situation with parenteral antibiotics, surgical exploration, hematoma evacuation, antibiotic washout, and CSD placement. Because of the low incidence of this complication, definitive statements concerning prevention and management cannot be made. However, we now recommend avoiding postoperative anticoagulants for at least 5 days if possible and avoiding vigorous physical activity for at least 3 weeks.

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Conflict of Interest: Bruce B. Garber MD is an occasional consultant for American Medical Services Inc. and Coloplast Corporation.

Statement of Authorship

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