



## Subcutaneous Placement of Inflatable Penile Prosthesis Reservoirs

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| <b>OBJECTIVE</b>             | To review our experience with subcutaneous inflatable penile prosthesis reservoir insertion in a large, single-surgeon series.  |
| <b>MATERIALS AND METHODS</b> | We carried out a retrospective review of 1000 consecutive Coloplast Titan inflatable penile implant procedures carried out by a single high-volume surgeon. Eight patients underwent subcutaneous reservoir placement (SRP) and are the subject of this review.   |
| <b>RESULTS</b>               | Eight of our last 1000 patients underwent SRP. SRP was only employed in patients with a thick subcutaneous abdominal fat layer, which would be capable of concealing the reservoir. Seven patients recovered uneventfully, and none reported a palpable or visible reservoir. One patient, who had 5 prior penile implant procedures, developed peri-prosthetic infection, and required complete device removal. Reservoir removal in this obese patient was facilitated by the device's subcutaneous location. |
| <b>CONCLUSION</b>            | SRP is a viable option for carefully selected obese patients. We suggest that this approach only be utilized in those with high body mass index and a thick subcutaneous abdominal fat layer. In thinner patients, the reservoir will be visible and/or palpable; we do not recommend subcutaneous placement under those circumstances. UROLOGY 88: 93–96, 2016. © 2016 Elsevier Inc.   |

Inflatable penile prostheses (IPPs) are a well-established treatment option for organic erectile dysfunction that does not respond to conservative measures. The traditional location for an IPP reservoir is the retropubic space of Retzius (SOR). This is typically accomplished via blind puncture through the floor of the inguinal canal, or under direct vision via a counter-incision or infrapubic approach. However, a variety of infrequent but severe complications have been reported with SOR reservoir placement, including bowel, bladder, vascular and ureteral injuries, and reservoir herniation.<sup>1,2</sup> In response to this, there are a number of recent reports detailing alternate sites, methods, and results of reservoir placement within the abdominal wall, usually in the space anterior to the transversalis fascia and posterior to the rectus abdominis muscles.<sup>3-9</sup> Abdominal wall reservoir placement techniques are gaining an increasing amount of traction among implanting urologists. However, these techniques can be difficult in obese patients.

Obesity and morbid obesity have become an epidemic in the United States. Recent data from the National Institute of Health indicate that 74% of U.S. men are over-

weight or obese, with a body mass index (BMI) of 25-39.9, and 4% have extreme obesity, with a BMI of  $\geq 40.0$ .<sup>10</sup> Consequently, implanting urologists are seeing an increasing number of overweight and obese men. Traditional SOR reservoir placement and high submuscular reservoir placement can be very difficult in this subset of patients, especially in the setting of prior abdominal surgery. We have employed subcutaneous reservoir placement (SRP) in some of these patients. Our literature review revealed only two prior case reports of subcutaneous penile implant reservoir placement.<sup>2,11</sup> In this study, we present our series of obese patients who underwent SRP.

### MATERIALS AND METHODS

We carried out a retrospective review of 1000 consecutive Coloplast Titan IPP procedures carried out by a single surgeon. Initial implants and revisions were included. Of these patients, 8 were selected for SRP, and are the subject of this review. Implantation was carried out using standard techniques, via a scrotal or infrapubic incision. The decision to carry out SRP was made intraoperatively. Criteria for SRP included: (1) a thick abdominal wall fat layer that would conceal the reservoir, and (2) difficulty or inability to safely carry out standard SOR or abdominal wall reservoir placement. When performing SRP via a scrotal incision, the reservoir was tunneled medially and the neck of the tunnel was approximated with absorbable suture, to avoid post-operative reservoir herniation. When performing SRP via an infrapubic incision, Scarpa's and Camper's fascias were approximated anterior to the reservoir, with 2-3 layers of running absorbable suture. A 125 cc Coloplast cloverleaf reservoir with a lockout valve was used in all cases. The reservoir was filled with

**Financial Disclosure:** Bruce Garber is an occasional paid consultant to Coloplast Corporation and American Medical Systems, Inc. The remaining author declares that he has no relevant financial interests.

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Submitted: July 5, 2015, accepted (with revisions): October 13, 2015

the minimal amount of saline required for full cylinder inflation, as determined by a surrogate reservoir test. This technique allows the cloverleaf reservoir to lay relatively flat within the abdominal wall. A closed suction drain and Foley catheter were used in all cases, and removed on the first postoperative day. Patients were then seen at 2 weeks for a wound check, at 6 weeks for inflate-deflate teaching, and periodically thereafter.

## RESULTS

Table 1 lists relevant information about these 8 patients. The average BMI in this series was 39, ranging from 28 to 49. All patients were available for postoperative follow-up, which ranged from 3 to 11 months. Seven of the 8 patients healed uneventfully. Postoperative exam revealed that none had a palpable or visible reservoir, no reservoir hernias developed, and all devices functioned normally. None of the 7 patients commented or complained about reservoir visibility or palpability. Figure 1 shows the postoperative result of patient # 7.

Patient # 4 developed peri-prosthetic infection and required explantation. This patient was a high-risk implant candidate who had 2 prior implants removed due to in-

fection and was reimplanted despite scarred corpora. Reservoir removal in an infected, obese patient can be quite difficult; however, reservoir removal in patient # 4 was quite easy due to its subcutaneous location.

## CONCLUSION

With the high prevalence of obesity in the U.S., implanting surgeons can expect to see an increasing number of obese patients who request penile implant insertion. Obesity can significantly alter anatomic structures and relationships. SRP reservoir insertion in an obese patient, especially one with prior pelvic surgery, can be difficult, risky, or impossible. Over the last few years, in an attempt to avoid the well-known risks of SRP reservoir insertion, implanting urologists have increasingly embraced abdominal wall reservoir insertion techniques. Reznicek et al<sup>9</sup> recently published a thorough review of these techniques and their historical progression. Armed with sufficient published data, Coloplast Corporation was able to obtain formal Food and Drug Administration approval for ectopic insertion of the Coloplast cloverleaf reservoir in May of 2015.

Our literature review revealed only two prior case reports of SRP.<sup>2,11</sup> In this manuscript we expand that literature, and present a small, preliminary series of SRP patients with short follow-up. Our results indicate that in carefully selected obese patients, SRP can be a safe and effective option. In addition, if an SRP patient ever requires implant removal or replacement, the reservoir will be easily accessible. We restrict SRP to those patients with a thick subcutaneous fat layer, which will conceal the reservoir. We do not recommend SRP for thin or mildly obese patients, as the reservoir will then be easily palpable and visible. We believe that our increased use of SRP in recent years has been due to an increased number of very obese patients who request an IPP, and to the increasing acceptance of ectopic reservoir insertion by implanting urologists. One caveat of the SRP technique is that if the patient subsequently loses a considerable amount of weight, he may require reservoir repositioning to a deeper location. It is also currently unknown whether a subcutaneous reservoir would be more prone to erosion, migration, or malfunction, by virtue of



**Figure 1.** Postoperative appearance of subcutaneous reservoir placement in patient # 7. (Color version available online.)

**Table 1.** Characteristics of patients who underwent subcutaneous reservoir placement

| Pt. Number | Age | Weight (lbs) | BMI | IPP surgical approach | Length of Follow-up (Months) | Previous Surgical Procedures   | Postoperative Complications |
|------------|-----|--------------|-----|-----------------------|------------------------------|--|-----------------------------|
| 1          | 67  | 220          | 30  | Scrotal               | 11                           | IPP implant (9/2013) and explant (11/2013)                               | None                        |
| 2          | 68  | 260          | 41  | Scrotal               | 10                           | IPP implant (1996), explant/reimplant (2005)<br>explant/reimplant (2014) | None                        |
| 3          | 64  | 295          | 44  | Scrotal               | 9                            | None   | None                        |
| 4          | 73  | 260          | 35  | Scrotal               | 3                            | 5 prior IPP procedures, 2 prior infections                               | Infection requiring explant |
| 5          | 70  | 210          | 28  | Scrotal               | 8                            | Robotic prostatectomy 2014   | None                        |
| 6          | 68  | 292          | 47  | Scrotal               | 8                            | None   | None                        |
| 7          | 61  | 352          | 49  | Scrotal               | 7                            | IPP explant and reimplant × 3  | None                        |
| 8          | 54  | 279          | 38  | Infrapubic            | 6                            | Umbilical hernia repair  | None                        |

BMI, body mass index; IPP, inflatable penile prosthesis.

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