Asian Journal of Andrology (2020) 22, 481–484
www.asiaandro.com; www.ajandrology.com

Open Access

ORIGINAL ARTICLE

Operational Andrology

Novel protective penile collar following inflatable penile prosthesis placement: the "Wang Collar"

Leonardo D Borregales[1], Jose Saavedra-Belaunde[1], Run Wang[1,2], Jonathan Clavell-Hernández[3]

Penile rehabilitation after inflatable penile prosthesis (IPP) implantation for the treatment of erectile dysfunction includes leaving the device partially inflated so as to preserve the penile length and to maintain hemostasis. With a partially inflated device, the penis becomes more sensitive and more susceptible to unintended insults during the immediate postoperative management. The "Wang Collar," a device intended to protect the penis in the early postoperative period, is hereby described. Three hundred and forty-eight patients had the "Wang Collar" included as part of their post-IPP management from August 2014 to February 2019. The protective collar, devised from a polystyrene cup with the bottom removed, is secured with a tape over the previously dressed and partially inflated penis. In order to evaluate the effectiveness of this device, we conducted surveys on the perioperative staff at three different institutions. The "Wang Collar" has been found to be beneficial in the early postoperative care of patients. Based on the answers to our questionnaire, the perioperative personnel found this device to be highly protective, especially when transporting the patient after IPP surgery, easy to work with, and almost never bothersome or irritative to the patient. We present a novel penile device after IPP placement, which we have found to improve patient satisfaction in the postoperative period. In addition, it eases the care of the patient by the perioperative staff. It is now our routine to use this device after IPP surgery. Further research is necessary to evaluate whether this device can decrease postoperative wound complications.

Asian Journal of Andrology (2020) **22**, 481–484; doi: 10.4103/aja.aja_123_19; published online: 17 December 2019

Keywords: erectile dysfunction; inflatable penile prosthesis; postoperative dressing

INTRODUCTION

Since its introduction in the United States in the early 1970s, the inflatable penile prosthesis (IPP) has become the most effective treatment modality for erectile dysfunction (ED).[1] However, IPP implantation is still not perfect, with the greatest complaint being penile shortening after the surgery.[2] Penile rehabilitation after IPP implantation includes leaving the device partially inflated so as to preserve penile length and to maintain hemostasis.[3] With a partially inflated device, the penis becomes more sensitive and more susceptible to unintended insults during the immediate postoperative management. We describe a novel additional postoperative device, the "Wang Collar." This device is intended to provide additional protection to the penis in the early postoperative period when the penis is most sensitive with the partially inflated IPP.

Proposals for a secured and hemostatic dressing after IPP placement have been previously described in literature. Henry described the so-called "Mummy Wrap" in an edition of the *Journal of Sexual Medicine* in 2009.[4] This consisted of a Kerlix®-based dressing that wraps the scrotum and penis in a figure-of-eight fashion with the intention to minimize hematoma formation. As this dressing is almost tape free, removing the dressing appeared to be remarkably easy on the day following surgery. The "Wang Collar" or postoperative IPP dressing is similarly fashioned with the use of a modified Mummy Wrap around the scrotum with the intention to avoid edema and hematoma formation. Equally important, our dressing also provides an extra safety mechanism by protecting the semi-inflated penis in a "touchless" manner. Although briefly mentioned in a previous study,[5] we hereby formerly present this simple postoperative dressing for patients undergoing IPP placement as a way to minimize postoperative discomfort and assist perioperative providers in the immediate care of our patients.

PATIENTS AND METHODS

All our patients had the "Wang Collar" at three institutions (University of Texas McGovern Medical School [UTH], MD Anderson Cancer Center [MDA], and St. Joseph Medical Center [SJMC] at Houston, TX, USA), and were included as part of their post-IPP management from January 2015 to February 2019. All patients underwent implantation of three-piece IPPs through either a penoscrotal or infrapubic approach. Of note, the postoperative dressing was used for all types of penile prosthesis implants, including patients with vasculogenic ED, patients with ED after prostate cancer treatments, and patients undergoing additional reconstruction for Peyronie's disease. This study did obtain approval from the Institutional Review Board of the University of Texas Health Science Center at Houston and was in accordance with the Declaration of Helsinki. In addition, consent was obtained from all the staff participating in the surveys.

How to place the dressing

The "Wang Collar" dressing requires a Kerlix™ 4-inch dressing roll, 6-inch soft cloth 3M Medipore tape (3M, St. Paul, MN, USA), and

[1]Division of Urology, The University of Texas Health Science Center, Houston, TX 77030, USA; [2]MD Anderson Cancer Center, Houston, TX 77030, USA; [3]St. Joseph Medical Center, Houston, TX 77002, USA.
Correspondence: Dr. J Clavell-Hernández (jclavell@urosurgeryhouston.com)
Received: 28 May 2019; Accepted: 26 August 2019

polystyrene cup (depending on the penile length: one cup to four cups). Prior to placing the dressing, we apply a small amount of bacitracin ointment to the surgical wound and cover it with a gauze and a transparent 4-inch 3M Tegaderm absorbent dressing.

We start by suspending the scrotum with one hand, ensuring that the IPP pump is also included, and wrapping it with a Kerlix™ 4-inch dressing roll. The assistant holds the penis upward ensuring that the entire base of the shaft and scrotum is secured tightly.

Following this, we then place a long piece (approximately 20 cm) of the 6-inch soft cloth 3M Medipore tape under the scrotum extending down to the perineum but ensuring that enough distance is left to not cover the anus (**Figure 1**). A second piece of Medipore tape is then placed to secure the top part of the dressing. This is performed by cutting in the middle of the tape to create a hole or round opening to let the penile shaft go through it (**Figure 2**). The polystyrene cup, with its bottom cut, is then placed over the penis and covered with two smaller pieces of the Medipore tape (**Figure 3**). A small wedge-shaped cut is made to the superior portion of the cup in order to secure the Foley catheter and minimize transference of movement to the penis (**Figure 4**). The device covers the penis in its entirety and is kept in place until postoperative day 1 when the Styrofoam cup is removed by the surgical staff. The remainder of the dressings is removed by the patient after 48 h.

Figure 1: Placement of a long piece (approximately 20 cm) of the 6-inch soft cloth 3M Medipore tape under the scrotum extending down to the perineum but ensuring that enough distance is left to not cover the anus.

Figure 2: A second piece of Medipore tape is then placed to secure the top part of the dressing. This is performed by cutting in the middle of the tape to create a hole or round opening to let the penile shaft go through it.

How to manage the dressing postoperatively

Our dressing does not affect IPP cycling or activation as the cup is removed on postoperative day 1 by the surgical team. The remainder of the compressive dressing is removed by the patient on day 2, except for patients actively taking blood thinners during the perioperative period who are recommended to maintain the dressings in place for 72 h. We uniformly begin IPP cycling 6 weeks postoperatively to allow proper wound healing and capsule formation and decrease hematoma formation. Of note, our standard multimodal pain regimen given to patients immediately postoperatively includes acetaminophen, nonsteroidal anti-inflammatory drugs (NSAIDs), and gabapentin. Narcotics are avoided and are only provided for refractory pain not controlled with the first regimen. This medication regimen has not been modified or increased since the implementation of the "Wang Collar."

Data analysis

In order to evaluate the effectiveness and added benefit of our novel penile dressing for patients who undergo IPP placement, we conducted surveys on the perioperative staff. These surveys were carried out at three different institutions (UTH, MDA, and SJMC) where we practice in Houston, TX, USA. In order to obtain information from all the immediate caring providers, we pass a simple 4-item questionnaire to the operating room (OR) nurses, postanesthesia care unit (PACU) staff, and floor nurses (for those patients staying overnight). Questions used to evaluate the effectiveness of the "Wang Collar" as a novel dressing are outlined in **Supplementary Information**.

Our intention was to evaluate the responses of the immediate postoperative staff as their interaction with the patient starts as soon as they are rolled into PACU. These nurses are heavily involved in the care

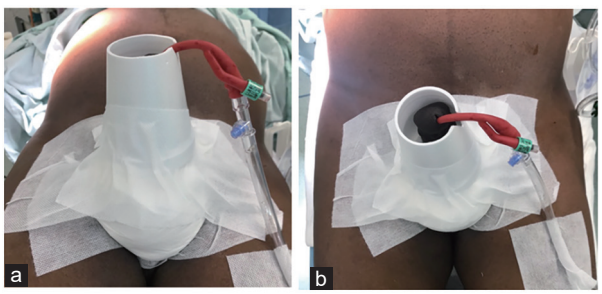

Figure 3: (**a**) Small wedge-shaped cut is made to the superior portion of the cup in order to secure the Foley catheter and minimize transference of movement to the penis. (**b**) The device covers the penis in its entirety and is kept in place until postoperative day 1 when the Styrofoam cup is removed by the surgical staff. The remainder of the dressings is removed by the patient after 48 h.

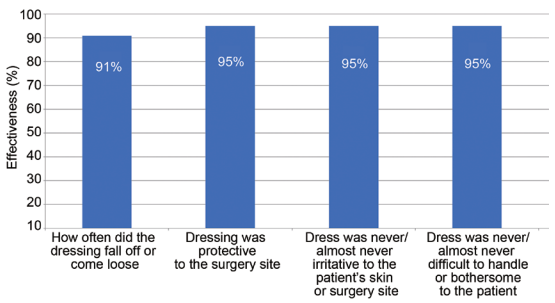

Figure 4: Effectiveness of the "Wang Collar" as noted by the perioperative staff.

of the patient as their activities include assistance with early mobilization, clothing, and voiding. We utilize our questionnaire to indirectly measure patient satisfaction. Although this is not a direct patient-reported outcome, nurses are immediately available to care for the patient. Patients are typically recovering from the anesthetics and surgical procedure, and therefore their input on questionnaires was not always easily accessible. We did obtain reports from patients via email, office phone calls, and rounds.

As this is a descriptive report, our data analysis was solely focused on obtaining percentages regarding the effectiveness of the device in each question and investigating the most commented recommendations given by perioperative personnel.

RESULTS

Infection and hematoma rates

Since the introduction of the "Wang Collar" in January 2015 until February 2019, a total of 348 patients have undergone IPP placement (274 virgin IPPs and 74 revisions). We routinely applied this dressing to all patients regardless of their length of stay (outpatient *vs* 23 h in observation).

We observed a total of nine patients with post-IPP infection (overall infection rate of 2.6%). Our total infection rate in patients undergoing virgin IPP (first prosthesis placement) with the application of the "Wang Collar" was 1.8% (a total of five patients). The other four patients with postoperative infection were patients undergoing re-do IPP (due to malfunction). The rate of hematoma formation is 0%, to our knowledge, since the implementation of the "Wang Collar."

Effectiveness of the "Wang Collar" as noted by the perioperative staff

A total of 22 nurses attending patients in the immediate postoperative phase of an IPP placement were surveyed. When asked how often did the "Wang Collar" or postoperative IPP dressing fell off or came loose, 91.0% responded never or almost never. Only one floor nurse found this dressing to fall off more than half of the times; however, the general comments obtained described this dressing as easy to work with (**Figure 4**).

With regard to its protective purpose, 14 nurses answered always (score of 5), 7 more than half of the times (score of 4), and just 1 half of the times (score of 3). Overall, 95.0% of the perioperative personnel found this dressing to be very protective to the patient, with a score of 4 or higher (**Figure 5**). None of the nurses ever described this dressing as nonprotective or with a score of 2 or less. Anecdotally, general comments obtained described that these patients reported less discomfort in the first several days postoperatively due to the added protection from tactile irritation.

Similarly, 95.0% of the personnel surveyed found that this dressing was never to almost never irritative or bothersome to the patient (**Figure 6**). There was only one reviewer who classified this dressing as irritative or bothersome more than half of the times or with a score of 4 or higher. Interestingly, the nurses commented that it served its protective purpose even though in some instances it could be embarrassing to the patient, specifically in common areas during transportation. Anecdotally, this concern has not been echoed by patients during postoperative rounds.

Comments obtained from the perioperative personnel included that "the 'Wang Collar' is beneficial in the early postoperative care of our patients," and "it prevents the penis from rubbing on sheets and clothes, which is a source of discomfort in the first days following surgery." The nurses also commented that "with the device, there are less complaints of pain by the patients." The operating room nurses and the recovery room staff appreciate the device as it eliminates their concerns of manipulating or hurting the penis when they are caring for or transporting the patients.

DISCUSSION

After implantation of a penile prosthesis, surgical outcomes and patient satisfaction are very dependent on the nature of postoperative management.[6] Prior studies evaluating patient's overall content after IPP noted that for some of them, the most unpleasant experience of the procedure was the dressing removal.[7] Perioperative interventions such as patient transportation, early mobilization, and Foley catheter movement can represent a significant challenge for those caring for the patient, especially while trying to avoid increased irritation or discomfort to the patient. As shown by our results, 92.0% of the perioperative personnel found that our novel protective penile dressing or "Wang Collar" after IPP placement was very protective, almost never bothersome or irritative during the perioperative course of our patients.

Historically, a variety of compressive tape dressings have been described by IPP implanters in an effort to provide wound coverage and facilitate hemostasis.[8] Many of these have been either too cumbersome or potentially harmful, leading in some instances to penile necrosis, as with the Coban-based "Soft Cast."[7]

One that has gained more traction for its reproducibility is the Henry Mummy Wrap™.[4] Gerard Henry published in 2009[4] his description of this nonsticky dressing, in order to decrease post-IPP inflammation and promote healing in the desired location. This dressing consists of a bandage gauze roll or Kerlix 4-inch roll, wrapped loosely around the penis from the most distal aspect down to the base of the shaft and then lifting up the scrotum. A "figure-of-eight" type of method is used to wrap the entire external genitalia until the dressing roll is finished.[4] Based on subsequent studies after his publication, by securing the scrotum and the pump in place with this wrap, postoperative complications such as expanding hematoma seemed to be reduced.[4,9] Since the introduction of the "Wang Collar," our rate of hematoma formation is 0%. We are aware that this rate may be underreported given that many patients with small hematomas might consider it a part of the postoperative healing process and do not report it to the surgeon.

The "Wang Collar" has the potential benefits of the Mummy Wrap while minimizing the irritation and discomfort produced from

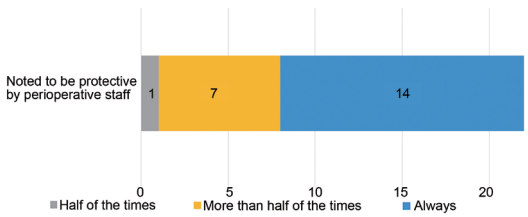

Figure 5: How protective is the "Wang Collar" during the immediate post-IPP period? IPP: inflatable penile prosthesis.

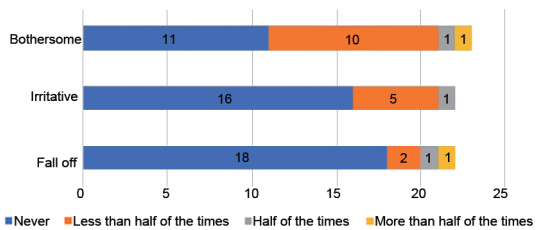

Figure 6: Discomfort noted by perioperative staff in patients with our novel post-IPP device. IPP: inflatable penile prosthesis.

the contact to the sensitive penis. We avoid placing a bandage gauze around the penile shaft *per se* with the placement of a polystyrene cup surrounding the penis instead. Based on our surveys and postoperative evaluations, the "Wang Collar" appears to be beneficial to the patient and nursing staff in the early postoperative care of our IPP patients. It prevents the penis from rubbing on sheets and clothes, which is a source of discomfort and patients' complaint in the first days following surgery. As evidenced by the nurse's reports, the operating room and recovery room staff appreciate the device because they no longer worry about manipulating or hurting the penis after initial IPP placement when they are caring for or moving the patients.

Our technique is simple and uses commonly available materials. We have conceived an easily fashioned dressing which helps to apply pressure to the scrotum and potentially increased capsule formation around the pump as well as to decrease hematoma formation. This device also aids in protecting the penoscrotal incision without risking a distal tourniquet effect.

Our study carries certain limitations. The study lacks objective patient-reported satisfaction rates and outcomes. The subjective nature of our results and lack of a control group are other limitations of our study. We believe that although our proposed dressing has some similarities with the Mummy Wrap, the addition of a Styrofoam cup provides another layer of protection and comfort to the patient and completely avoids compression to the penis itself. In addition, this type of compressive dressing provides the ability to maintain the distal penile shaft exposed for spontaneous voiding while keeping the scrotum under compression for 48 h in order to prevent scrotal edema and hematoma formation. Although this analysis may appear subjective, the nurses that care for our patients are the first responders to patients' complaints and have a first-line experience of the patient's overall satisfaction. Anecdotally, another limitation or inconvenience of this device, brought up by the nursing staff, was the inability to conceal or hide the "pitched tent." Some patients found this to be embarrassing especially when visitors were around or in common areas during transportation. Nevertheless, other patients have expressed feeling proud of the "pitched tent" and look at it as a restorative sign of their first erection after long-standing ED. Overall, the "Wang Collar" constitutes a potentially ideal dressing in the immediate perioperative care of patients undergoing an IPP as this keeps the penis completely surrounded and protected while minimizing contact to the penis and scrotum.

CONCLUSION

The "Wang Collar," a novel penile dressing for patients who undergo IPP placement, appears to be beneficial, protective, and not bothersome in the early postoperative care of our patients. It prevents contact to the most sensitive areas, has the potential to allow for hemostatic wound healing, and promotes capsule formation around the IPP pump while theoretically decreasing the rate of hematoma formation in the early postoperative phase. As evidenced by the nurses' reports, the operating room and recovery room staff appreciate the device as this keeps the penis completely surrounded and protected when they are caring for or moving the patient after IPP surgery. Further research is necessary to evaluate whether this device can decrease postoperative wound complications such as hematoma, wound infection, and penile pain.

AUTHOR CONTRIBUTIONS

LDB was involved in the data collection, drafting, writing, revision, and editing process. JCH was involved in the drafting, writing, revision, and editing process. JSB and RW equally contributed in the data collection, drafting, and revision of the manuscript. All authors read and approved the final manuscript.

COMPETING INTERESTS

All authors declare no competing interests.

Supplementary Information is linked to the online version of the paper on the *Asian Journal of Andrology* website.

REFERENCES

1 Rajpurkar A, Dhabuwala CB. Comparison of satisfaction rates and erectile function in patients treated with sildenafil, intracavernous prostaglandin E1 and penile implant surgery for erectile dysfunction in urology practice. *J Urol* 2003; 170: 159–63.
2 Montorsi F, Rigatti P, Carmignani G, Corbu C, Campo B, *et al*. AMS three-piece inflatable implants for erectile dysfunction: a long-term multi-institutional study in 200 consecutive patients. *Eur Urol* 2000; 37: 50–5.
3 Clavell-Hernandez J, Wang R. Penile rehabilitation following prostate cancer treatment: review of current literature. *Asian J Androl* 2015; 17: 916–22.
4 Henry GD. The Henry mummy wrap and the Henry finger sweep surgical techniques. *J Sex Med* 2009; 6: 619–22.
5 Clavell-Hernandez J, Wang R. Penile size restoration with nondegloving approach for Peyronie's disease: initial experience. *J Sex Med* 2018;15: 1506–13.
6 Wein AJ, Kavoussi LR, Campbell MF, Walsh PC. Campbell Walsh Urology. 11th ed. Philadelphia: Elsevier; 2016. p667.
7 Henry G, Hsiao W, Karpman E, Bella A, Carrion R, *et al*. A guide for inflatable penile prosthesis reservoir placement: pertinent anatomical measurements of the retropubic space. *J Sex Med* 2014; 11: 273–8.
8 Gupta NK, Ring J, Trost L, Wilson SK, Kohler TS. The penoscrotal surgical approach for inflatable penile prosthesis placement. *Transl Androl Urol* 2017; 6: 628–38.
9 Henry GD, Mahle P, Caso J, Eisenhart E, Carrion R, *et al*. Surgical techniques in penoscrotal implantation of an inflatable penile prosthesis: a guide to increasing patient satisfaction and surgeon ease. *Sex Med Rev* 2015; 3: 36–47.