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Epididymal Sparing Bilateral Simple Orchiectomy: Cost-Effectiveness and Aesthetic Preservation for Men with Metastatic Prostate Cancer

Aviva E. Weinberg,* Jen-Jane Liu, Michele Sandelien, Nathalie Waite and Jeffrey H. Reese

From the Department of Urology, Stanford University School of Medicine, Stanford (AEW), and Department of Urology, Santa Clara Valley Medical Center, San Jose (MS, NW, JHR), California, and The James Buchanan Brady Urological Institute and Department of Urology, Johns Hopkins University School of Medicine, Baltimore, Maryland (JJL)

Abstract

Introduction: In the last 2 decades medical androgen deprivation therapy has replaced surgical castration for the treatment of metastatic prostate cancer. We assessed costs and patient satisfaction associated with epididymal sparing bilateral simple orchiectomy in an underinsured, immigrant population.

Methods: We performed epididymal sparing bilateral simple orchiectomy in patients with metastatic prostate cancer between January 2003 and September 2014 at our institution. Procedures were performed in the operating room with the patient under general anesthesia and later under conscious sedation. Associated material and facility costs were calculated and compared to costs of androgen deprivation therapy with leuprolide or degarelix. Medication costs were calculated using wholesale acquisition costs. Patient satisfaction and body image perception were evaluated using a survey questionnaire.

Results: A total of 108 orchiectomies were performed in the operating room and 12 in the outpatient unit. The total cost of bilateral simple orchiectomy in the operating room was $4,118. By performing orchiectomy in the outpatient unit we reduced the cost to $2,101. The cost of orchiectomy in the operating room is the equivalent of 4 months of leuprolide and 7.8 months of degarelix. When performed in the outpatient clinic the cost of bilateral simple orchiectomy is equivalent to 2.1 months of leuprolide and 4 months of degarelix. Overall 95% of participants surveyed were pleased with the surgical results.

Conclusions: The average life expectancy of men with metastatic prostate cancer is 30 months and, thus, a onetime surgical cost offers significant cost savings. Further cost reductions are achieved by performing bilateral simple orchiectomy in the outpatient setting. By sparing the epididymis, patients are left with a sense of testicular preservation. Epididymal sparing bilateral simple orchiectomy is a cost-effective and cosmetically acceptable method of androgen deprivation therapy for patients with metastatic prostate cancer.

Abbreviations and Acronyms

ADT = androgen deprivation therapy

BSO = bilateral simple orchiectomy

ESO = epididymal sparing orchiectomy

LHRH = luteinizing hormone-releasing hormone

OR = operating room

WAC = wholesale acquisition cost

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* Correspondence: Department of Urology, Stanford University School of Medicine, 300 Pasteur Drive, S-287, Stanford, California 94305 (telephone: 650-723-4537; FAX: 650-498-5346; *e-mail address:* avivaw@gmail.com; avivaw@stanford.edu).

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Prostate cancer is currently the second leading cause of cancer morbidity and mortality. Less than 5% of cases are metastatic at diagnosis.[1] In the setting of metastatic disease the objective of therapy is disease control while maintaining an acceptable quality of life. Medical androgen deprivation therapy and surgical bilateral simple orchiectomy have been standard treatment options for metastatic prostate cancer. In the last 2 decades medical ADT has almost completely supplanted surgical castration for metastatic disease. Purported driving factors for the wholesale shift toward hormonal ablation include patient fears regarding surgical risks, body image concerns and beliefs regarding preservation of testicular size with medical therapy. Medicare policies in the 1990s created strong financial incentives for the administration of gonadotropin-releasing hormone agonists (with reimbursement based on 95% of the average wholesale price), resulting in a strong financial incentive in favor of medical ADT.[2]

The survival rates and clinical efficacy of biochemical castration among patients treated with androgen deprivation therapy and orchiectomy are similar.[3–5] However, combined androgen blockade therapy is far more costly. Estimates of Medicare costs for ADT exceed $480 million annually.[6] With the drug reimbursement policy changes which occurred as a result of the Medicare Modernization Act there has been nearly a 50% reduction in reimbursement for gonadotropin-releasing hormone agonist use. In addition, medical ADT requires patient compliance with frequent clinic followup for administration. Furthermore, in a public hospital setting like our own whose patient population is predominantly comprised of underinsured, nonEnglish speaking immigrants, compliance is a major factor in successful therapy.

Considering the reported equivalence in efficacy and survival as well as the high cost of medical therapy, we determined whether epididymal sparing BSO could be a cost-effective and cosmetically acceptable alternative to medical ADT in an underinsured, immigrant population. In this study we report our experience with epididymal sparing orchiectomy as a feasible and satisfactory method of androgen deprivation therapy in patients with metastatic prostate cancer.

Materials and Methods

Between January 2003 and September 2014 we performed 108 bilateral epididymal sparing orchiectomies in men with a diagnosis of advanced prostate cancer at Santa Clara Valley Medical Center, a safety net hospital serving immigrant and uninsured patients in the County of Santa Clara, California. We performed 96 ESOs in the OR with patients under general anesthesia. In December 2012 we shifted our procedures to the outpatient clinic setting and began performing them with patients under monitored anesthesia care. To date we have performed 12 ESOs in this fashion.

Surgical Technique

The surgical technique we used was epididymal sparing simple orchiectomy with epididymoplasty. Our protocol for orchiectomy with the patient under conscious sedation was first tested in the operating room using fentanyl and midazolam for sedation, and a combination of 0.25% bupivacaine and 1% lidocaine for local anesthesia.

After the induction of conscious sedation the patient is prepped and draped in the usual sterile fashion. A bilateral cord block is achieved with 10 cc local anesthetic into the spermatic cord. A wheal is then made along the midline anterior scrotum along the median raphe. A 3 cm incision is made along the median raphe with additional anesthetic injected into the dartos fascia. The dartos fascia and tunica vaginalis are entered sharply, and the testicle is delivered into the field. Additional local anesthetic is then infiltrated in the plane between the testis and epididymis, which provides anesthesia and hydrodissects the epididymis off of the testis (part *A* of figure). The testis is then dissected off the epididymal head and tail using needle tip electrocautery. The main vascular pedicle entering the testicle at the upper third of the epididymis may be cauterized or suture ligated. The wound is then irrigated and hemostasis is obtained.

The remnant epididymis is then folded on itself and further hemostasis is obtained by sewing these ends together with a figure-of-eight 2-zero Vicryl® suture (part *B* of figure). This almost spherical configuration gives the scrotum the bulk and appearance of a normal testicle (part *C* of figure). The contralateral testis is then removed in an identical fashion. The dartos fascia is closed with running 4-zero Vicryl and the scrotal skin with 4-zero chromic sutures in a running horizontal mattress. The patient typically returns in 2 weeks for a postoperative visit and in 6 weeks for a prostate specific antigen check.

Cost Analysis

Epididymal sparing orchiectomies were initially performed in the OR with the patient under general anesthesia and later