NERVE GRAFT TO RESTORE ERECTILE FUNCTION DURING RADICAL PROSTATECTOMY

Protocol: SUR044  
Effective Date: November 1, 2016

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INSTRUCTIONS FOR USE
This protocol provides assistance in interpreting UnitedHealthcare benefit plans. When deciding coverage, the enrollee specific document must be referenced. The terms of an enrollee's document (e.g., Certificate of Coverage (COC) or Evidence of Coverage (EOC)) may differ greatly. In the event of a conflict, the enrollee's specific benefit document supersedes this protocol. All reviewers must first identify enrollee eligibility, any federal or state regulatory requirements and the plan benefit coverage prior to use of this Protocol. Other Protocols, Policies and Coverage Determination Guidelines may apply. UnitedHealthcare reserves the right, in its sole discretion, to modify its Protocols, Policies and Guidelines as necessary. This protocol is provided for informational purposes. It does not constitute medical advice. This policy does not govern Medicare Group Retiree members.

UnitedHealthcare may also use tools developed by third parties, such as the MCG™ Care Guidelines, to assist us in administering health benefits. The MCG™ Care Guidelines are intended to be used in connection with the independent professional medical judgment of a qualified health care provider and do not constitute the practice of medicine or medical advice.

COMMERCIAL, MEDICARE & MEDICAID COVERAGE RATIONALE

Sural or other nerve grafts to restore erectile function during radical prostatectomy are not medically necessary.

No comparative studies between nerve grafts and standard medical therapy (e.g., intracorporal injection, or vacuum erection devices) have been completed. The evidence for nerve grafts for restoration of erectile function is derived mainly from non-randomized studies limited by small sample sizes. A randomized controlled trial was discontinued when it was determined that unilateral nervesparing radical prostatectomy was not effective.
Medicare does not have a National Coverage Determination or a Local Coverage Determination for Nevada for Nerve Grafts to Restore Erectile Function During Radical Prostatectomy (Accessed September 2016).

For Medicare and Medicaid Determinations Related to States Outside of Nevada:
Please review Local Coverage Determinations that apply to other states outside of Nevada.
http://www.cms.hhs.gov/mcd/search

Important Note: Please also review local carrier Web sites in addition to the Medicare Coverage database on the Centers for Medicare and Medicaid Services’ Website.

DESCRIPTION OF SERVICES

Erectile dysfunction is a common problem after radical prostatectomy. In particular, spontaneous erections are absent in patients who have bilateral resection of the neurovascular bundles as part of the radical prostatectomy procedure for treatment of localized prostate cancer. A technique called nerve-sparing surgery has been developed to prevent damage to these nerves; however, this technique is not possible in some patients.

Nerve grafting to replace resected cavernous nerves during radical retropubic prostatectomy has been proposed as a technique to increase the likelihood of restoring spontaneous erectile function. During the procedure, a donor nerve (e.g., sural nerve, genitofemoral nerve) is harvested from the patient and joined to the distal and proximal ends of the resected cavernous nerve. Grafting may be performed on one or both resected cavernous nerves. The sural nerve (a nerve traveling along the short saphenous vein in the lower leg) is the most common donor nerve used in the nerve grafting procedure during radical prostatectomy. The nerve is considered expendable and has been used commonly in other nerve grafting procedures for repairing injured peripheral nerves. During the sural nerve grafting procedure, a portion of the nerve is harvested from one leg of the patient and grafted to the resected cavernous nerve.

Advocates of nerve grafting believe that nerves should be preserved whenever compatible with complete resection of cancer, but that when the cavernous nerve must be resected or is damaged severely, graft replacement should be a consideration (Kim, 2001; Scardino, 2001). While the decision to spare or resect the neurovascular bundles is based on the surgeon's preference, it is influenced by clinical stage, prostate-specific antigen level, and transrectal ultrasound/biopsy results (Kim, 2001).

CLINICAL EVIDENCE

Siddiqui et al. (2014) examined the long term outcome of sural nerve grafting (SNG) during radical retropubic prostatectomy (RRP) performed by a single surgeon. Sixty six patients with clinically localized prostate cancer and preoperative International Index of Erectile Function (IIEF) score >20 who underwent RRP were included. Neurovascular bundle (NVB) excision was performed if the risk of side-specific extra-capsular extension (ECE) was >25% on Ohori' nomogram. SNG was harvested by a plastic surgeon, contemporaneously as the urologic surgeon was performing RRP. IIEF questionnaire was used pre- and postoperatively and at follow-up (3 years). Recovery of potency was defined as postoperative IIEF-EF domain score >22. There were 43 (65%) unilateral SNGs and 23
(35%) bilateral SNGs. The mean preoperative IIEF score was 23.4±1.6. Long term assessment reflected 19 patients (28.8%) had IIEF scores >22. The IIEF-EF scores for those who had unilateral SNG and bilateral SNG were 12.9±4.9 and 14.8±5.3 respectively. The authors concluded that SNG can potentially improve EF recovery for potent men with higher stage prostate cancer undergoing RP; and that the contemporaneous, multidisciplinary approach provides a good quality graft while expediting the procedure without interrupting the work-flow. However, the evidence is insufficient to conclude that this surgical technique is equivalent to bilateral nerve sparing prostatectomy or that long-term outcomes are improved by nerve grafting.

Davis et al. (2009) wanted to evaluate whether unilateral nerve-sparing (UNS) radical prostatectomy (RP) plus sural nerve grafting (SNG) would result in 50% relative improvement in potency at 2 years compared to UNS RP alone. The plan was to enroll 200 patients from October 2001–May 2006 in a randomized clinical trial from a single academic center. After 107 patients were randomized in a 3:2 ratio (66 SNG, 41 controls), a protocol-planned interim analysis was performed which reflected potency rates of 18 of 41 (44%) in the SNG group and 10 of 23 (43%) in the control group. Based upon slower-than-estimated accrual (8 per month planned vs 2 per month actual) and a <5% posterior probability that the groups would show a difference, early termination of the trial was recommended by the Data Monitoring Committee. Using data gathered from the 107 participants, the authors concluded that in this single-institution randomized study, unilateral SNG did not result in an increased potency rate at 2 years compared to UNS RP alone based upon a threshold significance level of at least a 20% (absolute) improvement. Secondary endpoints also did not show an improvement in time to potency or urinary function at 1 year. Based upon the power of this study, a smaller benefit could not be excluded. The authors believed that future study designs should anticipate inconsistent compliance with penile rehabilitation and 20–30% patient attrition.

Sugimoto et al. (2009) evaluated 24 patients who underwent unilateral nerve-sparing with contralateral cavernous nerve-grafting or bilateral nerve-grafting and 64 patients who underwent prostatectomy without nerve-sparing procedure. Patients in nerve-grafting group who recovered potency demonstrated higher sexual function scores compared with those without nerve-sparing procedure. However, the majority of these patients were not satisfied with their sexual function.

Kuwata et al. (2007) prospectively investigated health-related quality of life (HR-QOL), including sexual function in patients who underwent nerve grafting during a radical prostatectomy in comparison with those who underwent a non-nerve-sparing radical prostatectomy (22 patients had nerve-grafting procedures, 44 underwent non-nerve-sparing and non-nerve-grafting procedures). The observation periods ranged from 12-46 months (median: 29 months). For individuals who had nerve-sparing graft procedures (bilateral or unilateral), the sexual function score was significantly better in the nerve-grafting (bilateral nerve graft or unilateral nerve graft with contra-lateral nerve-sparing) patients than in the non-nerve-sparing(non-nerve-grafting patients). The sexual bother score, however, was more serious for the patients who underwent nerve-grafting surgery than for the non-nerve-sparing/non-nerve-grafting patients.

Porpiglia et al. (2005) evaluated 29 men who underwent laparoscopic radical prostatectomy with deliberate wide unilateral neurovascular bundle resection and preservation of the contralateral bundle. Fifteen men (group A) had an interposition sural nerve graft on the sectioned bundle, and 14 (group B) had laparoscopic radical prostatectomy with preservation of the unilateral bundle only. Erectile
function was evaluated after surgery, and at 3, 8, 12 and 18 months, using the five-item version of the International Index of Erectile Function (IIEF-5) questionnaire. The follow-up was complete for 12 men in group A and 10 in group B. Group A had significantly higher erectile function scores on the IIEF-5 at 12 and 18 months than immediately after surgery, whereas in group B the improvement was not statistically significant. According to the investigators, the study results suggest that laparoscopic sural nerve grafting during radical prostatectomy is feasible and safe; however, it cannot be concluded that sural nerve grafting is more effective than preserving the neurovascular bundle alone in retaining sexual potency.

Saito et al. (2007) evaluated 64 patients who underwent a radical prostatectomy and intraoperative electrophysiological confirmation of cavernous nerve preservation. Twelve patients underwent a unilateral interposition sural nerve graft (UNG) for the resected neurovascular bundle. Twenty-one and 31 patients underwent bilateral nerve-sparing (BNS) and unilateral nerve-sparing (UNS) surgery without a nerve graft, respectively. As the age of patients was significantly younger in the UNG group than in the other groups, age-matched analysis also was conducted. In the age-matched analysis, the postoperative sexual function (SXF) score of the UNG group showed an intermediate level of recovery between those of the BNS and UNS groups at 12 months and reached the same level as the score at 12 months of the BNS group at 18 months postoperatively. The difference in the SXF score between the UNG and UNS groups began to appear after 6 months postoperatively and increased steadily with time. However, the background factors, such as the baseline SXF score, the usage rate of phosphodiesterase 5 inhibitors, and the rate of comorbidities were different between the UNG and UNS groups.

A prospective study by Namiki et al. (2007) evaluated 113 patients undergoing radical retropubic prostatectomy for the rate of recovery of urinary continence and sexual potency. Patients were classified into 3 groups according to the degree of nerve sparing: unilateral nerve preservation with contralateral sural nerve graft interposition, bilateral nerve sparing, and unilateral nerve sparing. The bilateral nerve sparing group showed the fastest recovery, although by 24 months there were no significant differences observed between the bilateral nerve sparing group and the unilateral nerve sparing group with sural nerve grafting. The bilateral nerve sparing group reported a better sexual function score than the unilateral nerve sparing group throughout the postoperative period. During the first year postoperatively, the bilateral nerve sparing group and the unilateral nerve sparing group with sural nerve grafting had better urinary function results than the unilateral nerve sparing group. The authors concluded that the nerve graft procedure may contribute to the recovery of urinary function as well as sexual function after radical retropubic prostatectomy; however these findings need to be validated in a randomized trial.

According to the National Comprehensive Care Network (NCCN) prostate cancer guideline, replacement of resected nerves with nerve grafts has not been shown to be beneficial for recovery of erectile function after radical prostatectomy (NCCN 2016).

Preliminary evidence from some studies suggests that nerve grafting with unilateral nerve sparing radical prostatectomy may improve rates of return of sexual and urinary function. However, the evidence is insufficient to conclude that this surgical technique is equivalent to bilateral nerve sparing prostatectomy or that long-term outcomes are improved by nerve grafting.
U.S. FOOD AND DRUG ADMINISTRATION

Sural nerve transplant is a procedure, and as such, is not regulated by the FDA.

APPLICABLE CODES

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Coverage Determination Guidelines may apply.

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REFERENCES


Jul;178(1):212-6; discussion 216.


**PROTOCOL HISTORY/REVISION INFORMATION**

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The foregoing Health Plan of Nevada/Sierra Health & Life Healthcare Operations protocol has been adopted from an existing UnitedHealthcare coverage determination guideline that was researched, developed and approved by the UnitedHealthcare Coverage Determination Committee.