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Brief Correspondence

Dehydrated Human Amnion/Chorion Membrane Allograft Nerve Wrap Around the Prostatic Neurovascular Bundle Accelerates Early Return to Continence and Potency Following Robot-assisted Radical Prostatectomy: Propensity Score–matched Analysis

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Abstract

We present a propensity-matched analysis of patients undergoing placement of dehydrated human amnion/chorion membrane (dHACM) around the neurovascular bundle (NVB) during nerve-sparing (NS) robot-assisted laparoscopic prostatectomy (RARP). From March 2013 to July 2014, 58 patients who were preoperatively potent (Sexual Health Inventory for Men [SHIM] score >19) and continent (no pads) underwent full NS RARP. Postoperative outcomes were analyzed between propensity-matched graft and no-graft groups, including time to return to continence, potency, and biochemical recurrence. dHACM use was not associated with increased operative time or blood loss or negative oncologic outcomes ($p > 0.500$). Continence at 8 wk returned in 81.0% of the dHACM group and 74.1% of the no-dHACM group ($p = 0.373$). Mean time to continence was enhanced in group 1 patients (1.21 mo) versus (1.83 mo; $p = 0.033$). Potency at 8 wk returned in 65.5% of the dHACM patients and 51.7% of the no-dHACM group ($p = 0.132$). Mean time to potency was enhanced in group 1, (1.34 mo), compared to group 2 (3.39 mo; $p = 0.007$). Graft placement enhanced mean time to continence and potency. Postoperative SHIM scores were higher in the dHACM group at maximal follow-up (mean score 16.2 vs 9.1). dHACM allograft use appears to hasten the early return of continence and potency in patients following RARP.

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Over the last two decades there has been improvement in our understanding of prostatic anatomy and the surgical technique of radical prostatectomy. Robot-assisted radical prostatectomy (RARP) has brought about advantages such as enhanced 10× magnification, three-dimensional vision, and the dexterity of miniaturized instrumentation. However, even for patients with well-preserved neurovascular bundles (NVBs) there remains a convalescent period characterized

by incontinence and impotence [1]. This delay is probably due to an inflammatory response caused by traction injury to the NVB [2].

Physical traction on the NVB can be minimized by the surgeon but cannot be eliminated during mobilization of the prostate [3]. Tewari et al [3] used a traction monitor to evaluate the aspects of RARP inflicting the greatest mechanical force and showed that reduced NVB traction diminishes

ischemic nerve injury. Finley et al [4] tested regional hypothermia via a rectally placed cooling balloon. The group demonstrated improvements in the return of urinary continence, but not early sexual function. We have been awaiting the next step in innovation that transcends the technical aspect of nerve-sparing (NS) by biologically altering the prostatic NVB neuropraxia induced by surgical dissection [3]. Clinical use of growth factors and anti-inflammatory substances for prostatic NVB regeneration is novel, and dehydrated human amnion/chorion membrane (dHACM) is a source of implantable neurotrophic factors and cytokines [5,6]. The aim of our feasibility study was to ascertain if any functional benefit could be measured after placement of dHACM around the NVB following full NS RARP.

Full institutional board approval was granted for this study. Patients were included from the period March 2013 to July 2014 at our institution. All RARP procedures

were performed by a single surgeon using the transperitoneal six-port technique with a Da Vinci surgical system (Intuitive Surgical, Sunnyvale, CA, USA). Bilateral, retrograde, athermal NS RARP was performed in each patient, with bladder neck reconstruction, an anterior suspension stitch, and posterior reconstruction (Rocco stitch). There were 58 patients in this series, who were preoperatively continent (American Urological Association Symptom Score <10) and potent (Sexual Health Inventory for Men [SHIM] score >19) and underwent bilateral dHACM placement (AmnioFix; MiMedx Group, Marietta, GA, USA) at a cost of \$900 per patient (Supplementary Fig. 1). The dHACM allograft was cut into two longitudinal pieces and placed over each NVB as a nerve wrap. The wrap was placed circumferentially around the NVB after extirpative RARP, post anastomosis. The dHACM study cohort (group 1; $n = 58$) was computer-matched with a similar group of patients

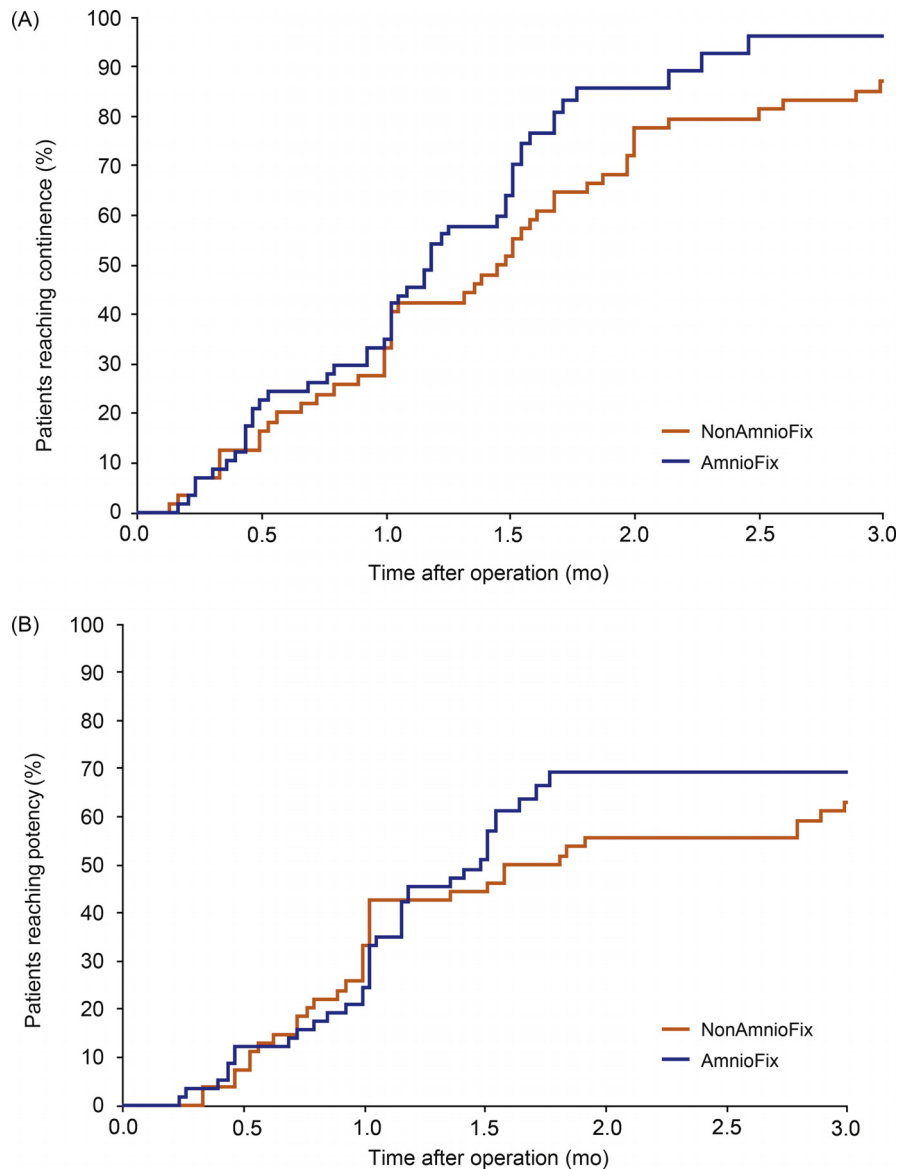


Fig. 1 – Cumulative index curves showing (A) time to continence and (B) time to potency. Time to reach continence: AmnioFix group, 1.21 mo; nonAmnioFix group, 1.83 mo ($p = 0.033$). Time to reach potency: AmnioFix group, 1.34 mo; nonAmnioFix group, 3.39 mo ($p = 0.007$).

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