

The Washington University Renorrhaphy for robotic partial nephrectomy: a detailed description of the technique displayed at the 2008 World Robotic Urologic Symposium

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Abstract Robotic partial nephrectomy is an emerging procedure. The Washington University Renorrhaphy involves robotic assistance, rapid closure of the collecting system, and renorrhaphy with sliding nonabsorbable clips. Bolsters are rarely used. Preliminary results have shown very short ischemic times with few complications. This communication offers a short video describing the renorrhaphy.

Keywords Robotic partial nephrectomy · Laparoscopic partial nephrectomy · Renorrhaphy · Renal cell cancer · Robotic surgery

Introduction

Robotic partial nephrectomy is an emerging procedure which is an alternative to laparoscopic and open partial nephrectomy. The procedure has been noted as similar to laparoscopic partial nephrectomy in several different technical descriptions [1–3]. Renorrhaphy has classically been performed with surgical bolsters and weck (Teleflex, Research Triangle Park, NC) hem-o-lok clips or lapra-ty (Ethicon, Cincinnati, OH) clips placed directly on the kidney with pressure [4, 5]. Alternatively, knots can be tied on the renal parenchyma to complete the renorrhaphy.

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In an effort to simplify renal reconstruction, and to shorten warm ischemia times, a modification of laparoscopic renorrhaphy was adapted to robotic partial nephrectomy. After performing this renorrhaphy in 40 robotic partial nephrectomy cases, and unveiling the renorrhaphy technique at the 2008 World Robotic Urologic Symposium, the goal of this communication is to describe the technique and provide an accompanied videographic atlas.

Materials and methods

Robotic renorrhaphy was performed with several modifications to previous descriptions of the laparoscopic technique. After tumor excision and possible usage of energy sources on the bed, the renorrhaphy is performed. Although surgical bolsters are not used, they can be used if deemed necessary by the surgeon.

Step 1 Collecting system is oversewn with 2-0 vicryl suture on an SH needle. The stitch may be tied, or a lapra-ty clip may be used to secure the stitch. Lapra-ty clips are absorbable, and hem-o-lok clips are not, so only lapra-ty clips are used on the collecting system.

Step 2 (video) The renal capsular stitches are placed, usually every 1 cm along the defect. A #1 vicryl stitch is used on a CT needle. On the end of the stitch there is a weck clip on the inner “renal side” of the stitch and a knot/lapra-ty on the distal aspect of the stitch (Fig. 1). The weck clip is useful to have on the side of the kidney so more surface area can be used when compressing the parenchyma.

Step 3 (video) After sewing both sides of the renorrhaphy, a weck clip is placed on the stitch. By holding the stitch tightly with the prograsp instrument, and using

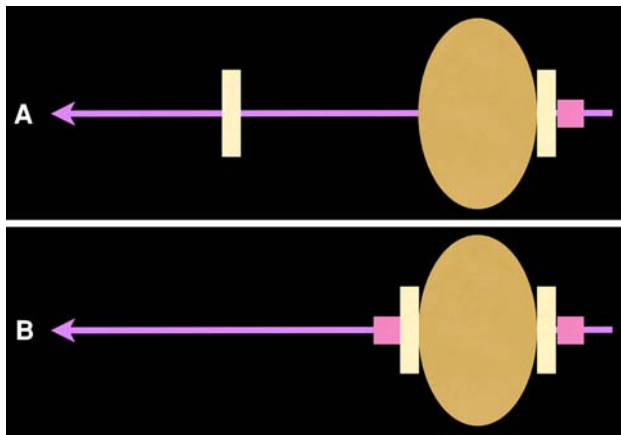


Fig. 1 Illustration of renorrhaphy suture. **a** Premade suture, a #1 vicryl with a lapra-ty clip and a weck clip on one side of the kidney. A second weck clip is placed and will be slid down to the kidney with a robotic needle driver. **b** After sliding down the weck clip, a second lapra-ty secures it from sliding back

the needle driver to apply gentle pressure on the weck clip (Fig. 1), the clip will slide down onto the kidney and can be tightened to any degree. It is critical to hold the stitch with a powerful grasper such as the prograsp so the surgeon may apply the proper countertension.

Step 4 (video) After sliding down the clips, they can be tightened further with each subsequent stitch, as less pressure is on each individual clip. After retightening the clips, lapra-ty clips may be applied to secure the weck clips from sliding back during renal reperfusion. Further stitches are placed in between existing sutures and then the kidney is unclamped.

Results

The simplified bolsterless renorrhaphy with “weck sliders” has been completed in 40 patients. The renorrhaphy has been rapidly performed with mean ischemic time of ~20 min in the series. For smaller peripheral tumors, <3 cm in size, the ischemic time is routinely less than 15 min. There has been one delayed bleed requiring transfusion in the series, which occurred in a patient who was

heparinized for a pulmonary embolism. There has been one urine leak. The descriptive details of the series are under separate review. These were the only two renorrhaphy-related complications.

Discussion

The Washington University Renorrhaphy differs from previous laparoscopic descriptions in that clips are used as “sliding” clips. Furthermore, bolsters have been largely eliminated, as the renorrhaphy can be adequately tightened. Other laparoscopic reports have also eliminated bolsters [6]. This technique is ideally suited to robotic partial nephrectomy as the clips can be retightened as needed, allowing an extra degree of safety when performing renorrhaphy. Furthermore, the robotic needle driver allows the surgeon to tighten the weck clip with precision and accuracy. This method has been successful in this series, which is the largest reported series in the literature of robotic partial nephrectomy.

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