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Laparoscopic laser lithotripsy inside the endocatch bag: An alternative technique for removal of large post lap pyelolithotomy calculi

Col Jaspreet Singh Sandhu[a,*], Maj Vishal Varma[b], Makarand Mishra[b]

[a] Senior Advisor (Surgery and Urology), Command Hospital (Central Command), Lucknow 226002, India
[b] Resident (General Surgery), Command Hospital (Central Command), Lucknow 226002, India

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ABSTRACT

Large staghorn calculi in unascended pelvic kidneys and in normally located kidneys with anatomy unsuitable for percutaneous nephrolithotomy have to be treated via pyelolithotomy. When performed laparoscopically, the extraction of these staghorn calculi, without extending skin incision at the port site is challenging. We describe the successful use of laparoscopic laser lithotripsy, intracorporeally, with the entrapped calculus inside the endocatch bag, for fragmentation and retrieval without extension of skin incision.

Introduction

The removal of benign non-functional kidneys post laparoscopic nephrectomy, without extension of port site incision is done either by tissue morcellation, inside the endocatch bag using a tissue morcellator, or by manual disruption by Kelly's clamp. Removal of large post laparoscopic pyelolithotomy calculi, on the other hand, is classically done by removal as whole by extending the incision[1,2] or after entrapment in the endocatch bag by breaking blindly by the feel, using Kelly's clamp.[2] In situ fragmentation during pyelolithotomy using laser lithotripsy, via flexible nephroscopy in the renal calyces, has also been described.[3] Whereas extension of the incision goes against the principles of minimal access surgery, the use of Kelly's clamp may not be feasible in extremely hard calculi, and incurs the risk of bag rupture and spillage of stone fragments. Similarly, laparoscopic in situ laser lithotripsy post pyelotomy is associated with intra-abdominal accumulation of irrigating fluid and contamination with potentially infected stone fragments. We describe the use of laparoscopic intra-corporeal holmium laser lithotripsy inside the endocatch bag in four patients to fragment the entrapped calculi and its retrieval without extending the incision.

Materials and methods

To evaluate the feasibility of this technique, four patients were included in the study from August 2015 till August 2016. Ethical clearance was taken. All patients signed informed consent

* Corresponding author.
E-mail address: sands46jazz@hotmail.com (J.S. Sandhu).
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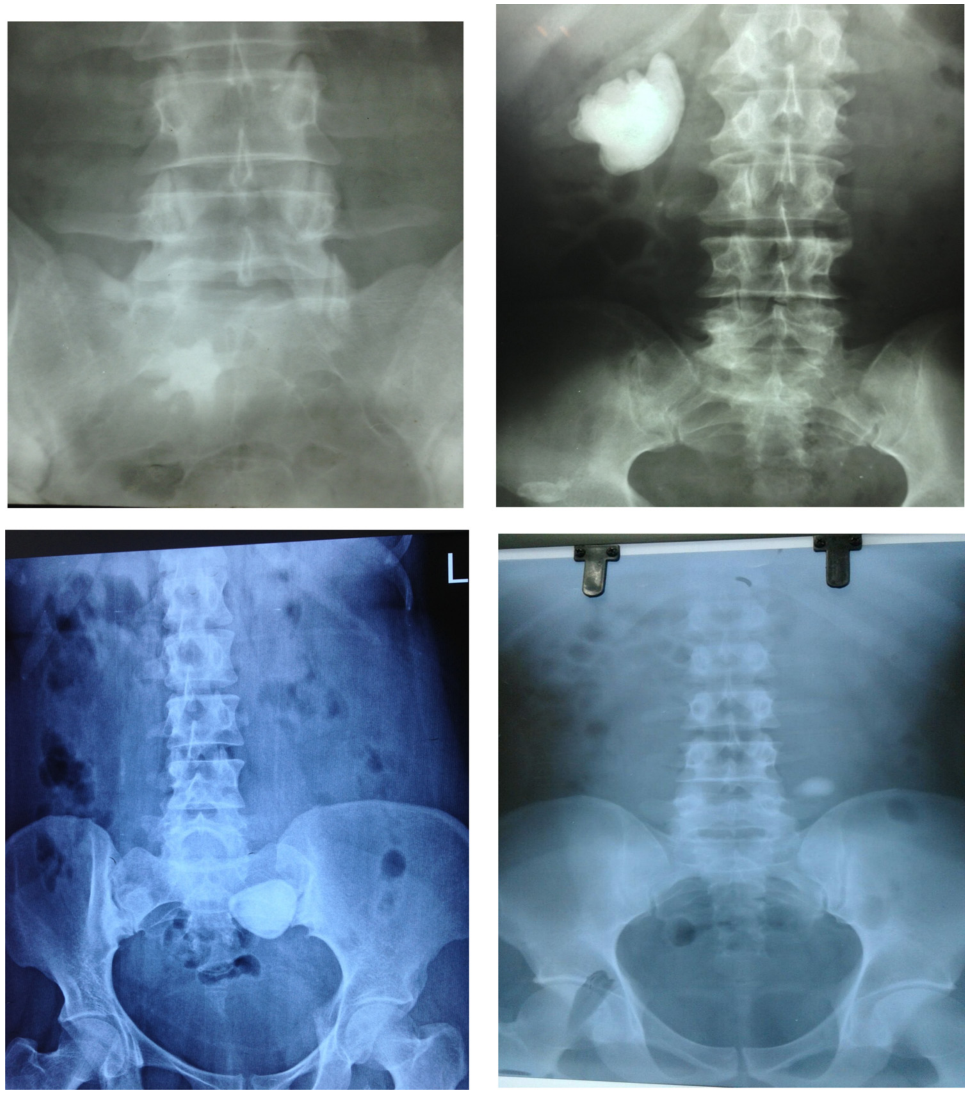

Fig. 1 – Radiographs of KUB region of all 4 patients.

Demography. A total of four patients including three male and a female, with an average age of 35 years (range 32–65), formed the study group. Left-sided unascended pelvic kidney with a solitary large renal pelvic calculus was detected in two patients. The third patient with the right unascended kidney had a calculus with staghorn configuration with a secondary calculus, whereas the fourth patient had a large renal pelvic calculus in a normally ascended right kidney, with anatomy unsuitable for percutaneous nephrolithotomy (Fig. 1). An IVP series and a Contrast Enhanced Computed Tomography (CECT) Scan were done in all cases and provided information about the anatomical relationships of ectopic kidneys and also calculated the two-dimensional area of the calculus. The average calculus area was 28 cm^2, with range of 10–48 cm^2.

All patients underwent standard transperitoneal laparoscopic pyelolithotomy, with calculus extraction, antegrade double J (DJ) stenting, and closure of pyelotomy. An indigenous endocatch bag, based on the principles of Nadiad endobag,[4] was prepared from the sterile inner polythene packing of the DJ stent packet sealed at one end, with unfolded dimensions of 10 cm × 15 cm and circumferential holding sutures or a ureteric catheter at the other open end.

The telescope was then transposed to the superiorly sighted 10 mm port. The bag was introduced completely via the 12 mm camera port and pulled inside under vision. The telescope was brought back to its original location and the main calculus along with the satellite calculus as in one patient were entrapped, bag closed and the holding threads or ureteric catheter extruded out by pulling via the camera port, after relocating the telescope to the superiorly sighted port. The camera port was subsequently removed and the circumferential edges of the bag were extruded out of the camera port site, by gentle pulling. The 24 Fr irrigating cystoscope (Richard Wolf), or the 19 Fr cystoscope (Karl Storz) was subsequently introduced into the bag through the extruded edges and the bag integrity confirmed. Normal saline was used as irrigant and the 550 μm laser fibre was introduced through the instrument channel (Fig. 2). Absence of blood in the bag permitted good vision and unhindered fragmentation at highest energy settings (Fig. 3a).

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