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### Mini-laparotomy radical cysto-prostatectomy for urinary bladder carcinoma

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#### ABSTRACT

**Introduction:** Open radical cysto-prostatectomy ( RCP) is the gold standard for invasive urinary bladder cancer in male .Though minimal invasive technique like laparoscopic or robotic assisted surgery is gaining popularity for surgical management in developed countries, open mini laparotomy is equally effective with similar oncological outcome and morbidity result. Our study aims to evaluate the feasibility of Mini-laparotomy RCP with ileal conduit (IC) or neobladder.

**Methods:** This is a descriptive cross-sectional study of 25 patients conducted from October 2016 to December 2019. Nineteen patients had muscle invasive urinary bladder cancer (MIBC), four had multifocal high grade non-muscle invasive bladder cancer (NMIBC) and two were BCG failure patients. Nineteen patients underwent RCP with IC and six with RCP and ileal Neobladder. We analyzed technical difficulty, operative time, blood loss, peri-operative complication for mini-laparotomy RCP.

**Results:** The mean age of patients was 63.2 years (46-81years). The mean operative time was 274 minute (180-420 minutes) with mean blood loss of 470 ml ( 300-2000 ml). Mean post operative ileus was observed for 2.8 days (2-4 days). All patients stayed in the hospital for mean days of 12.84 (7 to 25 days). All patients were mobilized early with mean intensive care unit (ICU) stay of 2.52 days. Mean lymph node extraction was 17.6. Two patients died of renal failure and hyperosmolar diabetes mellitus.

**Conclusion:** Minilaparotomy RCP is a feasible option in terms of early recovery with acceptable morbidity without compromising the oncological principles.

**Keywords:** Minilaparotomy, Post-operative ileus , Radical cystoprostatectomy

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## INTRODUCTION

**R**adical Cystoprostatectomy (RCP) is the treatment of choice for the muscle invasive urinary bladder cancer. This procedure is a major abdominal surgery. Gastrointestinal complications like anastomotic leakage, urinary leakage, bowel obstruction are the major complications leading to increased morbidity and mortality apart from major systemic medical complications peri-operatively. The treatment-related mortality due to these complications emphasizes on the clinical stage of the disease, sex, age and the tumour grade of the patients before undertaking RCP.<sup>1</sup> Introduction of minimal invasive approach like laparoscopic and robotic has decreased surgery related morbidity and mortality.<sup>1</sup> Laparoscopic method is tedious and has steep learning curve; and acquiring robot is expensive. Therefore we have introduced Mini-laparotomy RCP previously described by Rawal.<sup>2</sup> In Mini-laparotomy RCP, a short infraumbilical incision is made about 8-10cm and it is extraperitoneally approach. This study was conducted to evaluate the morbidity, mortality and oncological outcome of the procedure.

## METHODS

This is a descriptive cross-sectional study carried out on 25 patients between October 2016 to December 2019 with approval of institutional review committee of Kathmandu Medical College. Nineteen patients had muscle invasive urinary bladder (MIBC) cancer, four had multi-focal high grade non muscle invasive bladder carcinoma (NMIBC) and two had BCG failure. Nineteen patients underwent RCP with IC and 6 with ileal neobladder. The surgery was performed. One patient who previously had undergone partial cystectomy was excluded. Minilaparotomy RCP was first popularized by Sudhir Rawal et al in 2008 using 8-10 cm infraumbilical midline vertical incision from symphysis pubis. With infraumbilical retroperitoneal approach both ureters were mobilized, standard pelvic lymph nodes dissection carried out up to common iliac vessels, bladder and prostate dissected out and neurovascular preservation whenever possible. During the procedure, we analyzed technical difficulty with small low midline incision, operative time, blood loss, post-operative ileus and perioperative complications.

## Operative procedure:

Low mid line infra-umbilical of about 8-10 cm was given in all cases. After reaching retroperitoneal space vas deference and divided. Pelvic lymph nodes were dissected out meticulously using bipolar diathermy preserving obturator nerves and vessels on both sides. Both ureters were mobilized up to the urinary bladder and divided. Distal margins were sent for histological examination. Left ureter was further mobilized up to upper ureter and brought to left side through sigmoid mesentry. After removal of specimen approaching retropubic space superficial prostatic vessels are tied and with further dissection, endopelvic fascia is cut. Further dissection down led to apex of the prostate after ligating the deep vein. Neurovascular bundle is saved as far as dorsal vein complex possible by meticulous dissection of the posterolateral surface of prostate. Membranous urethra is hooked and cut at the apical junction to get the adequate length for the neobladder case. Prostate is slowly lifted up from the prerectal space simultaneously taking care of the prostatic pedicle by ligating and using ligasure(covedien) or harmonic by Ethicon. On dissecting the Seminal vesicals both Vas are ligated and cut. Denonvilliers fascia is opened and bladder meticulously dissected up during which bladder pedicals are ligated and cut by ligasure. Whole specimen of prostate and bladder is dissected out after dissecting out the remnant of urachus upto umbilicus.

For ileal conduit, length of 15-20 cm distal ileum is separated sparing the last 15 to 20 cm of distal ileum upto ileocecal junction and ends anastomosed. Both ureters are anastomosed to proximal end of the conduit in Nesbit or Wallace fashion after stenting with 5fr feeding tube using 5/0 chromic catgut.. These stents are used for the protection of uretero-ileal anastomosis and are usually removed after 7-10 days.

For Neobladder, 55 cm of distal ileum is separated and pitcher pot bladder is created sparing the last 15-20 cm of distal ileum. Ureteroileal anastomosis is done in Nesbit or Wallace fashion. The anastomosis is also stented which is taken out from the newly constructed bladder. Suprapubic catheter(SPC) is inserted into the neobladder. Neo-urethral anastomosis is done by parachuting method using polydioxanone 4/0.

Pelvis drain is placed. Hemostasis is secured and abdominal wound is closed by polydioxanone 1/0 and skin stapled. Patients are observed in intensive care as required. Early mobilization and early feeding was encouraged. All tubes were removed periodically starting with ureteral stents on 7<sup>th</sup> day, pelvic drain when drain less than 50 ml and SPC on 10-14<sup>th</sup> day. SPC is used for continuous irrigation if required. After patient is discharged patient is kept on regular follow to take care and teach ostomy care in case of IC case. For neobladder case, patient is counseled of incontinence and erectile dysfunction

## RESULT

Twenty five male patients were included in this study.. Mean age was 63.2 years (range 46-81). There were four diabetic, six hypertensive and one had chronic obstructive pulmonary disease. Mean serum creatinine was 0.948. CECT abdomen and pelvis revealed T<sub>2-3</sub>N<sub>0-2</sub>M<sub>0</sub> lesions. Histological diagnosis prior RCP was made on TURBT and 19 were found to have muscle invasion (MIBC) with grade 2-3. Four patients had non-muscle invasive bladder cancer (NMIBC, T<sub>1</sub>G<sub>3</sub>) but multicentric in nature with carcinoma in situ (CIS). Two patients underwent radical surgery for BCG treatment failure for NMIBC high grade. All patients underwent Minilaparotomy RCP. Nineteen patients underwent ileal conduit (IC) and six patients Pitcher-pot ilea Neobladder (NB). Upstaged Final histopathology was seen in three

patients ranging from pT<sub>1</sub>N<sub>0</sub> to pT<sub>3b</sub>N<sub>2</sub>. Two of the patients had Neo-adjuvant chemotherapy and 5 received adjuvant chemotherapy for their adverse histopathological finding (Table 1). Mean lymph node extraction was 17.6. The operative time ranged from 180 to 420 minutes (mean of 274 minutes). Mean blood loss was 470 ml (range 300-2000ml). Nine required blood transfusion. All were ambulated within the range of 2-3 days, drain removal by 8-22 days and soft diet started within 4-11 days (Table 2).

Post-operative ileus (POI) was observed for 2-4 days with mean of 2.8 days. ICU stay was between 2-3 days with the mean of 2.52 days. Three patients had atelectasis and four patients had chest infection. Wound dehiscence was seen in two patients requiring re-suturing. One patient had rectal injury and needed ileostomy and two patients developed subacute intestinal obstruction. Ileal conduit retraction was seen in one patient but did not need re-operation to correct it. All other patients had uneventful post-operative period (Table 3). Length of hospital stay was between 7-25 days with mean of 12.84 days (Table 3). Hospital stay was more in NB case as the stents and tubes were removed periodically. Ureteric stents were removed in 7 days, suprapubic stent in 10 days, and drain on 11<sup>th</sup> or 12<sup>th</sup> day and finally on 14<sup>th</sup> day for NB case. For IC cases, ureteric stent was removed on 7<sup>th</sup> day and discharged when drain was minimal.

All patients were kept under 3 monthly follow up.

**Table 1: Demography**

| Number of patients | Age (years)    | Ultrasonography | CT SCAN abdomen and pelvis                                   | Bone scan | TURBT                | Post BCG failure |
|--------------------|----------------|-----------------|--|-----------|----------------------|------------------|
| 25                 | Mean<br>63.2   | Growth +        | Range<br>T <sub>2-3</sub> N <sub>0-2</sub><br>M <sub>0</sub> | Negative  | MIBC, G2-3<br>(19)   | 2                |
|                    | Range<br>46-81 |                 |  |           | NMIBC<br>T1G3<br>(4) |                  |

**CECT: Contrast enhanced CT scan, TURBT: Transurethral resection of bladder tumor**

**Table 2: Operative Finding**

| NACT / AD CT | RCP +IC | RCP+ NB | Histopathology (HPE)                              | Lymph Node ex- traction | Operative Time                            | Blood Loss                      | Blood Tranfusion | Drain removal   |
|--------------|---------|---------|---|-------------------------|---|---------------------------------|------------------|-----------------|
| 2/5          | 19      | 6       | Range $pT_1N_0$ to $pT_3N_2$<br>HPE up- staged: 3 | Mean 17.6               | Mean 274 minutes<br>Range 180-420 minutes | Mean 470 ml<br>Range 300-2000ml | 9                | Range 8-22 days |

NACT: neo-adjuvant chemotherapy, ADCT: Adjuvant chemotherapy, RCP:Radical cystoprostatectomy, IC:Ileal conduit, NB: Neobladder

**Table 3: Post-operative Period**

| ICU stay                         | Hospital stay                      | Complications | POI                             | Wound Infection | Wound Dehiscence | Systemic Infection        | DVT  | Ileostomy | Rectal Injury with ileostomy | Subacute intestinal obstruction | Ileostomy retraction/ prolapse | Incontinence at 6 <sup>th</sup> month |
|----------------------------------|------------------------------------|---------------|---------------------------------|-----------------|------------------|---------------------------|------|-----------|------------------------------|---------------------------------|--------------------------------|---------------------------------------|
| Mean 2.52 days<br>Range 2-3 days | Mean 12.84 days<br>Range 7-25 days |               | Mean 2.8 days<br>Range 2-4 days | 2               | 2                | Chest: 4<br>Atelectasis:3 | none | 1         | 2                            | 1/0                             | None                           |                                       |

ICU: Intensive care unit, POI: Post-operative ileus, DVT: Deep vein thrombosis

**DISCUSSION**

Radical cystoprostatectomy is one of the effective procedures to deal with muscle invasive urinary bladder cancer. It was first described by Bricker in 1951.<sup>3</sup>RCP was first started in our center in 2012. RCP remains the choice of treatment despite recent advances in radiochemotherapy. Trimodality therapy including TURBT, chemoradiation is another option when RCP is not feasible or refuses radical surgery. Many retrospective studies support RCP’s oncological outcomes and satisfactory postoperative quality of life (QOL).<sup>4</sup> Improvement in surgical technique have

increased the patient’s acceptance of this surgery. Surgical technique refinements including sparing of neurovascular bundle for sexual function, novel procedures to divert urine, minimizing post-operative complications by smaller abdominal incision, early mobilization and early feeding to decrease post operative ileus (POI) will decrease surgery-related morbidity and mortality.<sup>5,6</sup>RCP is indicated in many conditions like carcinoma in-situ (CIS) transitional cell carcinoma(TCC) of bladder,High grade , BCG therapy failure or intolerance( $T_{1b}$ ), invasive TCC ( $T_{2-3}$ ), squamous cell carcinoma, adenocarcinoma

and sarcoma of the urinary bladder. RCP involves standard pelvic lymphadenectomy of the iliac and obturator nodes with removal of the urinary bladder en bloc, prostate, seminal vesicles and small length of membranous urethra .

Minimal invasive surgeries (MIS) like laparoscopic and robotic approach have been described and in increasing trend in developed countries. They claim to provide better cosmesis, decreased perioperative complication but fails short of long term oncological results.<sup>8,9</sup>MIS also has a steep learning curve, more operating time, high operating cost and inclination towards IC over NB due to lack of expertise in intracorporeal making of NB. Anil et al reported Pfannenstiel incision for RCP. They claimed it to have less postoperative morbidity and median operative time of 5 hours.<sup>7</sup> They found no significant differences in-hospital mortality between open and MIS(odd ratio ,0.98;pvalue=0.95), Similarly Kulkarni et al presented RCP with extraperitoneal approach by vertical abdominal incision with similar result and advantages.<sup>9</sup>In contrast ,there are many studies supporting robotic surgery to open surgery with equivalent functional ,complication and oncological outcomes. Robot-assisted radical cystectomy (RARC) has gained popularity to treat muscle-invasive bladder cancer to improve functional outcomes and reduce complication rates over open radical cystectomy (ORC). Satkunasivam et al showed comparable outcomes between robotic and open techniques, supporting the feasibility of minimally invasive surgery<sup>9</sup> Feasibility and safety of RARC in terms of oncological, pathological and perioperative results, at least, equivalent to ORC was supported by the study conducted by Josep et al.<sup>10</sup>In 2008, Rawal et al reported small infraumbilical vertical incision and extraperitoneal approach for RCP with IC or NB. The minilaparotomy RCP as reported has better post-operative period without major complications and oncological outcomes.Our present case series have tried to focus on minilaparotomy RCP in respect to surgical outcomes. Smaller abdominal incision and extraperitoneal approach minimizes tissue handling and may help early bowel movement, early mobilization and subsequently decreased perioperative systemic and local complications.<sup>2,7</sup>Patient undergoing major surgeries may present peri-operatively with local and or systemic complication leading to mortality. To minimize morbidity and mortality surgical techniques

and approaches have evolved as we have adopted Minilaparotomy extraperitoneal approach RCP. Major surgery like RCP may present with major and minor surgical as well as medical complications like chest/wound infection, DVT, bowel obstruction and anastomotic leak. In our cases all patients had smooth peri-operative period with mean operative time of 4.54 hours with blood loss of 483.3 ml. Hospital stay was recorded with mean of 12.59 days. Two mortalities were due to nonsurgical causes and that were after being discharged. Complications reported may be statistically insignificant due few numbers of cases but it is worth citing that we were able to minimize surgery related morbidity in our preliminary cases of small low midline extraperitoneal approach, optimizing co-morbid conditions and early mobilization. Chest infection and atelectasis were the commonest complication followed wound dehiscence.

Less common complications were rectal injury, bowel obstruction and ileal conduit retraction. Chang et al reported 18% (n=54) of his patients experienced POI as most common minor complication and with higher likelihood of ileus if there is increased blood loss and major complication.<sup>11</sup>Chang et al further reported that patients who received blood transfusion were more likely to need intensive care (P=0.019). Maffezzine M et al suggested that complete pain control and avoiding hypovolemia will help return early bowel movement.POI in their series beyond four days was observed in 17.7%. All six patient except for 7<sup>th</sup> one did not have hemodynamic instability with less ICU stay, early recovery and adequate pain control.<sup>12</sup>In our case series POI was seen in the range of 2-4 days(mean 2.74 days).We observed that after few cases of RCP we were able to decrease our operative time with minimal tissue handling and minimizing blood loss and hypovolemia(Table 3).Prolong need of ICU stay and elective ventilation was only required for the case who had to undergo abdomen suturing for wound dehiscence twice.All patients had short ICU stay with early weaning from ventilator. POI returned in few days and patients were mobilized quickly without any untoward complications. Our initial data on 25 cases were encouraging in terms of in-hospital morbidity without compromising oncological outcome.

## CONCLUSION

Minilaparotomy radical cystoprostatectomy (RCP) is feasible with early recovery . Oncological principle

was not compromised with acceptable complication and no mortality peri-operatively.

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