# LUMBOTOMY;
## AN UNDER UTILIZED INCISION FOR RENAL AND UPPER URETERAL ACCESS

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**ABSTRACT... Background:** Urolithasis is a common urological ailment since antiquity. Treatment of urolithasis has witnessed a revolutionary change with the advent of minimally invasive endoscopic techniques. However in developing countries very few cases of the renal stone disease are being treated using minimally invasive techniques and vast majority are still being managed with open surgery. **Objectives:** The objective of the study was to compare the two incisions used for renal and proximal ureter access, and find out which was better in our set up. **Methods:** We carried out a study at our center, comprising of 50 cases of solitary renal stones, to compare the traditional oblique lumbar (OL) incision with dorsal lumbotomy (DL). Patients included in the study were with a BMI of less than 30, all ages, having single large stone of renal / proximal ureter, extra renal pelvis, no previous surgery on the ipsi-lateral side. **Results:** The study revealed that the lumbotomy incision is better than the traditional lumbar oblique incision in terms of surgery time, post operative pain, early return to work and cosmetically accepted scar. **Conclusions:** After analyzing the data we came to the conclusion that the lumbotomy incision was superior to the oblique lumbar incision in selected cases and we recommend that it should be used specially in centers where facilities for endoscopic/minimally invasive management are not available.

**Key words:** Lumbotomy, urolithasis, urinary calculi, stone disease, open surgery for urolithasis, Pakistan

## INTRODUCTION

Urolithasis is a common urological ailment in afro-asian our part of the world. Its prevalence in this part of the world is from 4-20%[1]. In Pakistan, the incidence of urolithiasis is generally estimated at between 5 to 18%; however, no national data exists and only estimates are possible. Treatment of urolithasis has witnessed a revolutionary change in the past 20 years from open surgery - attended with a lot of complications (haemorrhage, hernias and long hospital stays) to minimally invasive endoscopic techniques like ureterorenoscopy (URS) with intracorporial lithotripsy, percutaneous nephrolithotomy (PCNL) and extracorporial shockwave lithotripsy (ESWL). These development have changed the milieu of urology for the management of renal stone disease such that a negligible number of cases of urolithasis are being managed by open surgery in the developed world. However reverse is true in the developing countries like Pakistan where health budget is less than 0.5-0.8 percent of the GDP[2]. Resulting in deterioration of Health facilities in the public sector over the past few decades. Very small percentage of renal stone disease is being treated using minimally invasive techniques while a vast majority of the patients are still being managed with open surgery, especially at district and thesil headquarter hospitals.

Renal calculi, congenital abnormalities and proximal ureteric calculi form a major part in the open urological surgery. Traditionally a long oblique lumbar incision is made to approach the kidney or proximal ureter. However a more important incision for renal access "DORSAL LUMBOTOMY", with better results in certain scenarios has dropped back stage in the urological theater. The probable reason for this injustice is the wrong selection of cases which leads to difficulty in surgery and most surgeons ultimately leave this approach aside.

The author is practicing urology for the past 15 years in both public and private sectors and has ample experience in both open and minimally invasive surgery, he has used the Lumbotomy for a number of procedures on upper urinary tract, but has specifically chosen cases of solitary renal calculi so as to standardize the parameters for the purpose of analysis. However similar results have been observed for other procedures, done through lumbotomy, as well.

We carried out a study at our center, comprising of 50 cases of solitary renal stones, to compare the traditional

oblique lumbar (OL) incision with dorsal lumbotomy (DL). Following variables were chosen.

Time of surgery, adequacy of access, hemorrhage, hospital stay, cost effectiveness, post operative pain and analgesia requirement, return to work, and incisional hernia formation.

## METHODS

### Inclusion Criteria

Patients with BMI of less than 30, all ages, having single large stone of renal / proximal ureter, extra renal pelvis, no previous surgery on the ipsi-lateral side and having a normally functioning contralateral kidney.

### Exclusion Criteria

Grossly over weight patients with a BMI of over 30, having multiple small calculi, raised serum urea/createnine level, pyelonephritis, previous surgery on ipsi-lateral kidney.

### Position of patient

Children under the age of 8 years were placed prone on the table with lumbar bridge raised. Older patient were placed in semi prone position such that the hips were perpendicular to the table and the chest was at 45 degrees to the table being supported by a pillow/sand bag, and lumbar bridge raised, so as to open up the lumbar space[3,4].

### The incision

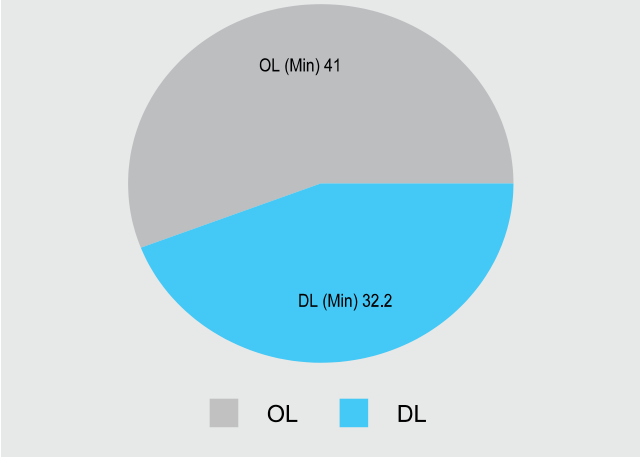
Dorsal lumbotomy incisions are of two types vertical and transverse. The vertical Incision is started below the margin of 12$^{th}$ rib[5] and extended caudally parallel or oblique laterally for 7 to 10 cms depending on the space required for the procedure and space available between the costal margin and ilica crest, while transverse skin incision is made, along the Langer's lines, lateral from the paraspinal muscle border and is used in infants and todlers[6,7]. Thoracodorsal fascia was split along the incision line and erector spinae and quardratus lumborum muscles were separated and fascia gerota exposed and incised thus revealing the kidney and proximal ureter. Specially taking care to identify and preserve the genitofemoral nerve which traverses the course of the incision.

The 50 cases were selected from the OPD according to inclusion criteria and alternately subjected to DL and OL renal access. The predetermined variables were recorded and the patients were followed up for an average period of 8 months. The results thus obtained were analyzed for average and range, however as the number of cases were limited therefore statistical significance was not calculated.

## RESULTS

The average surgery time was 32.2 minutes (range 25 to 45 minutes) in the DL patients and 41 minutes (range 35 to 55 minutes) in patients undergoing OL, a difference being 8.8 min on the average, (Fig1).

**Fig-1. Surgery time**




Haemorrhage during the surgery was about the same for both groups. OL average 38.2 mililiters (range 20 to 50 mililiters) and for DL average 33.6 mililiters (range 20 to 70 mililiters) (Fig2).

Adequacy of exposure is a subjective feeling, however there was more space available to operate in OL with a possibility of extending the incision while DL was thought to be adequate in 21 (84%) out of the 25 cases under study as compared with 25 (100%) out of 25 case in the OL group.

Significantly less pain was felt by the patients undergoing DL averaging 5.2 (range 4 to 7) on a 1-10 pain scale on

day three while 6.08 (range 5 to 8) was the average for patients undergone OL, requiring more use of parenteral as well as oral analgesics, which resulted in more cost and longer hospital stay. (Fig 3).

**Fig-2. Bleeding**

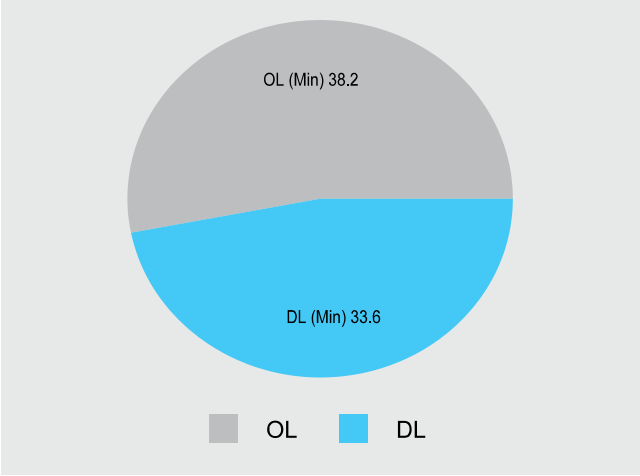
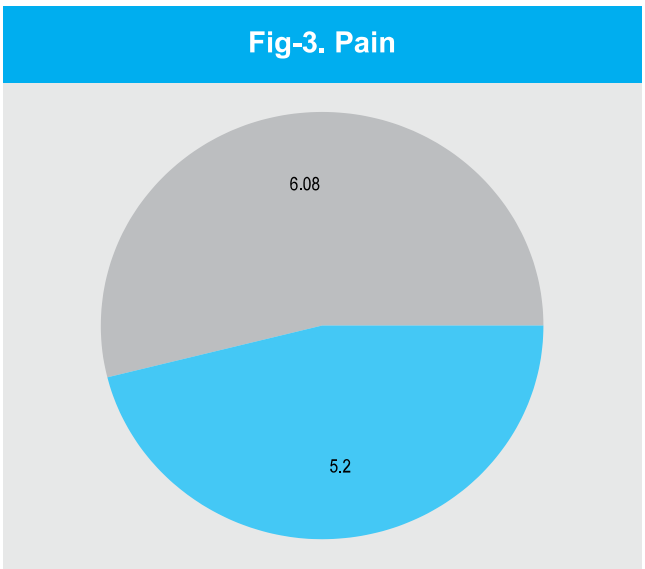



**Fig-3. Pain**




Hospital stay was 2.68 days (range 2 to 4 days) post operative for the patients under going DL while it was 5.9 days (range 4 to 9 days) for patients under going OL (Fig 4).

Cost was calculated in terms of surgery charges, length hospital stay, need for medication, frequency of follow-up visits during the early post operative period and was found to be significantly more.

Return to work, the patients who under went DL were pain free by third post operative day on the average and were permitted to join their normal routine work by 10.8 post operative day (range 8 to 15 days) after removal of stitches where as patients undergoing OL experienced significant degree of pain requiring analgesics till 6th post operative day and thus had a longer hospital stay and did not report for work till 19.64 post operative day (range 12 to 25 days)on an average and were not allowed to

**Fig-4. Hospital stay**

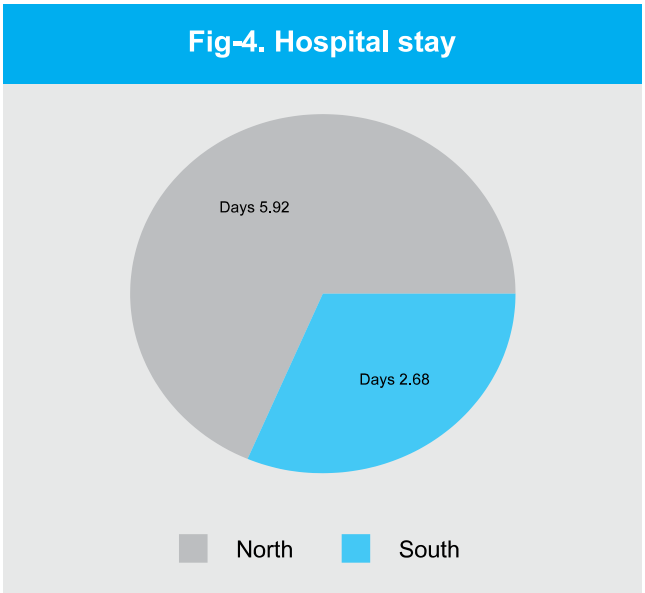
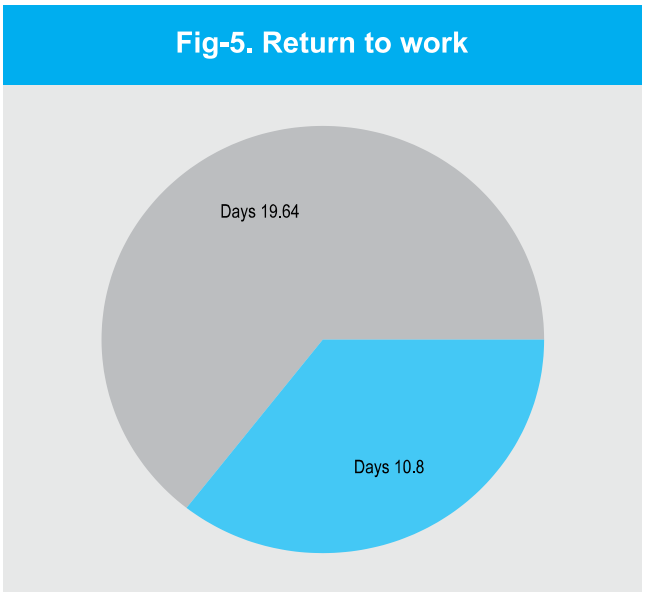



**Fig-5. Return to work**



perform heavy manual work for up to 6 weeks. This resulted in significant loss of work hours (Fig 5).

Cosmetically the OL incision was not acceptable and the female patients were specially more concerned. Five out of 25 (20%) were not satisfied by the cosmetic results, while DL was acceptable to 24 out of 25 (96%) patients were satisfied by the cosmetic results.

Hernia formation was not observed in patients undergoing DL whereas one case of incisional hernia was seen seven months after surgery in OL group. Which is statistically significant.

No operative or disease related mortality occurred in both groups during hospital stay or the duration of follow up.

## DISCUSSION

As the developed world has given up on open surgery in favor of minimally invasive surgery therefore there are a very few references available on the subject during the last two decades. How ever developing countries still rely on relatively cheaper but effective alternatives and therefore open surgery has a lot of role to play to alleviate the sufferings of the under privileged.

In surgical practice, deciding on the right type of surgical access for a specific condition is a skill of its own for a surgeon. The decision to select a specific incision would depend on several aspects e.g. operative site, related anatomical structures, easy access, fewer complications, quicker healing and minimum scar. But, at times, all these options might not be fulfilled and the surgeons have to make a professional judgment as to decide on what's best for the patients' condition.

Dorsal lumbotomy is an old incision and was used to gain access to the renal and upper ureteric pathologies[8]. It has not only been used to manage young children (infants and children under 12 years)[9,10] but also older children and even adults[8] suffering from renal and proximal ureteric pathologies. However it was given up for the conventional oblique lumbar incision due to the fact that conventional incision provided wide access to the renal fossa and had the ease of extension both proximally and distally and nearly all the renal pathologies could be easily managed through this incision.

Although now a days ultrasonographic, endoscopic and percutaneous procedures have taken over virtually all of the renal and upper ureteric surgery, even then we feel that in the third world countries where the people are non affording, open surgery still has a lot of role to play and minimum invasive surgery[11] in the form of dorsal lumbotomy can reduce economic burden and improve quality of life of patient under going surgery. Researchers have even suggested that laproscopic surgery for renal pathologies specially pyeloplasty in comparison with open surgery is far superior[12,13,14,15].

We endeavored to trespass into the domain of dorsal lumbotomy incision to explore its utility for the poor, non affording communities of the third world, in settings of third world.

Other studies[9,16] carried out on this incision have also revealed similar results in terms of reduced length of hospital stay, reduced pain, early return to work and low incidence of incisional hernia formation. Lumbotomy incision is also considered safe, easy and effective approach for upper urological tract surgery even in children[10]. Posterior lumbotomy, modified by the adjuvant use of nephroscopy and postoperative stents has also been used by some centres and found to be an acceptable alternative to minimal access surgery[17].

Prerequisite for using DL, specially for the beginners, should be adequate experience of renal handling by OL and good tissue identity where as the patient should have an extra renal pelvis, solitary pelvic stone, no previous surgery, pyelonephritis, or recent extra-carporial shock wave lithotripsy (ESWL), all of which cause local inflammation and adhesions, lead to dissection difficulties and may cause tissue damage due to small incision. The selected patient should not be too obese as the already small incision becomes even smaller when it gets deeper, however these limitations do not apply for the experienced surgeons.

Solitary, small renal calculi, small stag horn calculi with extra renal pelvis, proximal ureteric calculi, PUJ

obstruction, especially in children. However more complicated surgeries in which excessive haemorrhage is expected or extension of the incision is anticipated, should not be performed by this incision as a routine. We also suggest that this incision should also be avoided for renal oncological surgery.

To reduce the number of confounders it was decided that uniformity would be achieved by using the standard antibiotic protocol of the hospital, using the same suture material in all the cases and avoiding patients with factors leading to poor healing/wound formation like diabetes mellitus uraemia jaundice etc.

Revival of this incision, also advocated in other studies[7,18] would have a positive impact on the poorer section of the community by reducing expenses on medicine, shorter hospital stay, short period of follow-ups and reduced chances of incisional hernia requiring re-surgery, subsequently reducing the work hours lost to the illness.



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A man is not finished when he is defeated. He is finished when he quits."

***Richard M. Nixon***