

**Original article:**

## **Urinary bladder closure-in vivo comparative study between single layered VS double layered closure**

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### **Abstract**

Out of 42 cases of cystotomy , in 21 patients of group A bladder opening was closed by full thickness single-layered continuous suture while in another 21 cases of group B bladder closure was done by double layer suturing technique. In either group no significant difference in postoperative results was noted except lesser operating time with use of less suture material in group A and slightly better hemostasis in group B.

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### **Introduction**

Suprapubic cystotomy is commonly done in surgical practice to remove stones/foreign body in urinary bladder, in partial cystectomy/excisional or incisional biopsy of bladder tumors, reimplantation of ectopic ureter, in failed perurethral catheterization in retention of urine, urinary diversion, traumatic rupture of bladder or railroad operation in rupture of urethra as well as in open transvesical prostatectomy(1). It is conventionally done by open method or by laparoscopy nowadays. Cystotomy closure is done by different suturing techniques either in single layer or double layers(2,3,4). Urinary leakage, adhesion, bleeding and calculus formation over inner side of suture lines are common complications of cystotomy closure(5). As urinary leakage causes delayed wound healing, excessive inflammatory reaction & fibrosis, weak or ugly/hypertrophic scar formation the bladder closures should be perfectly watertight(6,7). Though ex-vivo comparative studies between different suturing techniques in animals could be found in review of literature, such studies in vivo were found less. Thus, present study was undertaken to evaluate the results of single vs double layered closure of bladder wall in human.

### **Material and methods**

All cases who underwent suprapubic opening of bladder(cystotomy) were randomly divided into two groups A & B. In group A patients bladder wall closure was done by single layered full thickness continuous(SFTC) suturing technique bringing all the layers including mucosal and seromuscular layers in total apposition securing complete hemostasis. In group B patients bladder opening was closed in two layers by first suturing mucosal layers in continuous appositional suturing pattern and then seromuscular layer was brought together by continuous inverting Lambert suturing technique securing complete hemostasis. Vicryl 2-0 was used in both groups as suture material and Skin was closed by interrupted silk sutures after putting retropubic drain in either group. Perurethral Catheterization was done and kept for 14

days in both groups and perioperative care including preoperative preparations, Intravenous fluid, antibiotics,diet,dressings etc was kept on similar patterns in either group.Results were evaluated by keeping in mind opertive-time, general systemic conditions,local wound conditions like urine leak,bleeding, haemtoma or serous collection, infection, inflammatory reaction, quality of scar,postoperative haematuria etc.Ultrasound examination was done on 7th and 14th postoperative days to look for any collection or adhesion and after 3months and 6months to exclude recurrent calculus formation or encrustation over suture lines or adhesion around it.Cystoscopy was also done after 3 months and 6 months to see quality of healing,any encrustation over suture-line or stone formation.Any urinary leakage was checked by retrograde double contrast cystography using urograffin and air on 14th day before removal of perurethral catheter taking X-rays in ventrodorsal(AP) and lateral views. Routine urine examination was done on 14th day,28th day and after 3months interval to look for crystalluria/pus cells.

**Results**

All the innformations collected were properly recorded and analyzed before drawing any conclusions.Results-

Table-1

| Age group       | Group 1 |            | Group 2 |            |
|-----------------|---------|------------|---------|------------|
|                 | Number  | Percentage | Number  | Percentage |
| 1yr to10yrs     | 2       |            | 3       |            |
| 11yrs to 20yrs  | 1       |            | 1       |            |
| 21yrs to 30 yrs | 1       |            | 1       |            |
| 31yrs to 40yrs  | 3       |            | 2       |            |
| 41yrs to 50yrs  | 5       |            | 4       |            |
| 51yrs to60yrs   | 4       |            | 6       |            |
| Above 60 yrs    | 5       |            | 4       |            |

Table-2

| Sex    | Group-1 |            | Group-2 |            |
|--------|---------|------------|---------|------------|
|        | Number  | Percentage | Number  | Percentage |
| Male   | 17      |            | 18      |            |
| Female | 4       |            | 3       |            |

Table- 3

| Ccomplications                      | Group 1 | n=21 | Group-2 | n=21 |
|-------------------------------------|---------|------|---------|------|
| Haematuria                          | 2       |      | 1       |      |
| Haematoma/seroma                    | 1       |      | 2       |      |
| Urine leak                          | 0       |      | 0       |      |
| Wound infection                     | 2       |      | 3       |      |
| Encrustation/<br>calculus formation | 0       |      | 0       |      |
| Hypertrophic<br>scar/Keloid         | 0       |      | 0       |      |
| Incisional Hernia                   | 0       |      | 0       |      |

Out of 42 cases 35 were male and 7 were females and were from 4yrs to 72 yrs of age with maximum were of above 40yrsof age.In either group males outnumbered females and age as well as sex distribution were almost similar in either group.

The operating time required was 10 to 15 minutes less in Group A than in Group B though complications rate was almost equal in both groups with bleeding(haematuria/haematoma or seroma being the commonest though not alarming in any case and stopped by itself with clear urine within 24 hrs.No case in our series got any urinary leak.In no case encrustation or calculus formation was found on ultrasound or Cystoscopy nor crystalluria was noted in routine urine examination.

**Discussion**

Closure of openings in hollow viscus (eg.intestines) was conventionally done in two layers to achieve good apposition of mucosa to mucosa in first layer and then second layer to approximate serosa to serosa to avoid any leak and adhesion. Later some started doing three layered closures to achieve perfect hemostasis. But addition of layer after layers compromised blood supply of suture line leading to ischaemic necrosis and thus poor healing, leak and more adhesion(8) .Thus,single layer closures was undertaken to avoid ischemia and for more anatomical approximation with less construction time,lower cost and perhaps lesser chance of anastomotic leakage(9).

Similarly urinary bladder closures after surgery was traditionally done in two layers or three layers and both were found equally effective in achieving watertight seal and hemostasis(10).However,in experimental studies in dogs single layered closure of cystotomy was found to provide as good healing as by double layered closure(11).It was also supported by positive results found in repair of bladder rupture in postpartum mares by single layered techniques(12).Inclusion of mucosal layer in suturing were observed causing calculus formation in rats(13).

In present study single layered closures of human urinary bladder were compared with double layered

closures and both were found to be equally satisfactory regarding strength of healing, incidence of postoperative complications like haematuria, encrustation over suture lines or calculus formation, urinary leak etc. Greatest advantage of single layered closure was lesser operative time with less amount of suture materials used, shorter operative time definitely reduces anaesthesia time and so postoperative better and faster recovery.

### Conclusions

Single layered closures are as successful in cystotomy repair as double layered but have distinct advantage of less time consuming, less costly and less cumbersome but as the series is small, a multicentric larger double blind studies are required to reach more definite conclusion.

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