

Injury to the urinary tract during childbirth

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Throughout human existence, women are suffering from injuries to the urinary tract as a consequence of childbirth. Due to the close proximity of the genital tract (uterus, cervix and vagina) to the urinary tract (urinary bladder and urethra), there is every possibility of injury of various degree to the urinary tract during parturition resulting in variable morbidities. In this era of modern medicine with tremendous advancement in medical technology, the obstetrician should try to avoid the avoidable injuries, detect the inadvertent injuries at the earliest moment and treat appropriately to alleviate the morbidities.

Major injuries to the urinary tract during childbirth were reported as 43 per 100,000 births by Onnuvra VC et al¹. Incidence of urinary bladder injury due to obstetric reason was stated as 0.14% to 0.94%. Urinary bladder injury during caesarean delivery is 0.013% to 0.096%². Urinary bladder injury during caesarean section following once previous caesarean section 0.2%; following repeat caesarean section 0.6%. Overall incidence of injury to urinary bladder, ureter, both urinary bladder and ureter were 11.7%, 4.7%, 5.3% respectively³.

Iatrogenic bladder injuries are classified as follows -

Grade 1- Contusion, intramural haematoma/ partial thickness laceration.

Grade 2 - Extraperitoneal bladder wall laceration less than 2 cm.

Grade 3 - Extraperitoneal laceration more than 2cm/ intraperitoneal laceration less than 2cm.

Grade 4 - Intraperitoneal bladder wall laceration more than 2 cm.

Grade 5 - Intra or extraperitoneal bladder wall laceration involving the trigone or bladder neck.

Factors influencing urinary tract injuries -

1. Previous caesarean section.
2. Adhesive disease.

3. Unsuccessful TOLAC (Trial of labor after cesarean delivery).

4. Obstructed labour.

5. Delivery conducted by untrained person (non institutional).

6. Injudicious use of instrumental delivery.

7. Destructive operation.

Phipps et al reported in a case control study (with 0.28% incidence of urinary tract injuries) found that repeat caesarean section cases were 4.22 times more vulnerable for this type of injury. Chances of injury increase with number of repeat caesarean viz⁴ - following first caesarean section - 0.13%, second- 0.9%, third -0.28%, fourth -1.17%, fifth - 1.94% and sixth-1.49%. Incidence rises in emergency section (31% vs 11%). Chances of injury also rises in those who had caesarean during labour, further increase in incidence of injury occurs if the caesarean is done during 2nd stage of labour. High rate of injury observed at 9-10 cm dilatation (33%) when compared with 0 to 1 cm dilatation (17%)⁵.

Incidence of urinary tract injury during childbirth increases secondary to the adhesive diseases found at index surgery. The incidence of adhesive diseases following caesarean section is 46-65%. Pathogenesis of adhesive diseases depends on fibrin, coagulation factors and inflammatory cells which in turn contribute to the repair of damaged tissue (peritoneum). Risk factors for adhesions include – infection, excessive manipulation, increase blood loss, adhesiolysis, tissue ischaemia etc. Single layer closure of uterus has 7 fold increase chance of adhesion when compared with double layer closure in CS. Unsuccessful TOLAC is associated with increased incidence of urinary bladder injury (1.1%).

Sites of injury - 95% urinary bladder injury occur at dome (mostly 6 cm, rarely 10 cm) of the bladder, others at

trigone. Those following previous caesarean section, usually involves the old caesarean scar.

Presentations - Patients already suffering from urinary tract injury may present with haematoma; pain in urethra or suprapubic region; sometimes also pain in the flanks. Some may also present with fever. Incontinence and dysuria are also presented by some others.

Detection of urinary injury - Primary repair of the injury is of paramount importance for good prognosis. For early and primary repair detection of injury at the earliest moment is must. For this it is essential to maintain a high degree of suspicion in those patients having risk factors. Proper investigations like ultrasonography, MRI, cystoscopy (in selected cases), urine analysis and culture etc are to be performed to rule out or detect other risk factor. Any patients following a difficult or instrumental delivery when present with haematoma, dysuria etc should be suspected to have urinary trauma. In a VBAC case with instrumental delivery and deep vaginal tears urological injury is most likely. In a VBAC case sometimes urological injury may remain unnoticed, where a cystoscopy is necessary ⁶. During caesarean section, slightest doubt of urological injury must be confirmed. This can be done by a dye test (methylene blue or indigo carmine) or cystoscopy or by instilling sterile milk into the bladder.

Treatment of injury - Repair of urinary bladder is done by delayed absorbable suture (3-0, 2-0) in 2 layers (inner musculo-epithelial and outer muscular). Urinary bladder is to be drained continuously by a 16 F Foley's catheter for 10-14 days. Trigonal damages are to be repaired continuously avoiding the ureteric opening. Ideally ureteric catheters may be placed in these cases which may be kept for 7 days. In extensive damage of bladder, often repair by a suprapubic drain should be put additionally which is to be removed after 7 days.

Prevention of injury - To avoid ischaemic damage or to treat some minor to moderate damages of urinary tract indwelling catheterisation is very useful. For prevention it is kept for 10 days and for treatment of small fistula for 2-3 months. In case of placenta percreta if placental tissue infiltrate into the bladder partially, instead of dissecting and injuring the bladder, it may left untouched and treated with inj methotrexate. Urinary bladder is to be emptied always before any manipulation or operative intervention. Proper preoperative counselling and intraoperative recording is essential to avoid future problems. Adhesive diseases are to be suspected and diagnose early. 'Sliding Sign' of USG

helps in diagnosing adhesion. When positive, uterus do not slides below the parietal fascia of abdomen on deep breathing. On entry to peritoneal cavity, gentle blunt dissection is required and viscera and vital structures are to be identified. Confirmed dense adhesion to the bladder and intestine should be dealt with sharp dissection. Use of aqua dissection is useful in most cases. Approach should always be from the convenient area with the structures dissected identified well. As the rate of urological injury is higher in caesarean section compared to normal delivery, an attempt to avoid primary caesarean section in avoidable cases is useful. Role of partograph is crucial in this regard. Training in operative delivery, reorientation programmes for practitioners and nurses are necessary to reduce complications. Protocol for VBAC should be in place in labour units. In distorted anatomy, to facilitate dissection of urinary bladder it is to be distended with fluid (preferably methylene blue or N/S). Prompt management of excessive haemorrhage, helps in identifying structures and avoid further injury.

Conclusion

Urinary tract injury during childbirth is common. In the present era of modern medicine cases like obstructed labour is minimised, whereas due to increased incidence of caesarean section and VBAC injury to urinary bladder, specially around the scar is on the rise. High degree of suspicion and timely intervention can minimise urological injury to a great extent. Proper protocol based management, partographic monitoring of labour and frequent orientation programmes amongst the health care personnel can minimise this problem to a great extent.

Conflict of interest: None. **Disclaimer:** Nil.

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