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Opinion Article

Reconstruction of Lower Urinary Tract Defects Following Severe Pelvic Trauma

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DESCRIPTION

Severe pelvic trauma involving the lower urinary tract represents a complex clinical scenario that often requires staged and individualized management. Injuries may involve the bladder, urethra, or both, and are commonly associated with pelvic fractures resulting from high-energy mechanisms such as road traffic collisions or industrial accidents. The combination of skeletal disruption and soft tissue injury creates significant challenges in restoring urinary continuity and preserving function.

Diagnosis is confirmed using imaging studies, with retrograde cystography considered the most reliable method for detecting bladder rupture. Computed tomography cystography has become widely used due to its ability to assess associated injuries in the abdomen and pelvis. Early recognition is essential to prevent complications such as urinary extravasation, infection, and delayed healing.

Management of bladder injuries depends on the type and severity of rupture. Small extraperitoneal injuries may be managed conservatively with catheter drainage, allowing spontaneous healing. Larger or intraperitoneal ruptures typically require operative repair. Primary closure of the bladder defect is performed using absorbable sutures, ensuring watertight closure and adequate drainage postoperatively.

Urethral injuries are a common and often more complex component of pelvic trauma. Posterior urethral disruption frequently occurs in association with pelvic fractures due to shearing forces at the prostatomembranous junction. Patients may present with blood at the urethral meatus, inability to void, or a high-riding prostate on examination.

Initial management of posterior urethral injury often involves urinary diversion using suprapubic catheterization. This allows bladder drainage while avoiding further urethral manipulation during the acute phase. Definitive repair is usually delayed until the patient is stable and inflammation has subsided.

Delayed urethral reconstruction is commonly performed several months after injury. The preferred technique involves excision of fibrotic tissue and end-to-end anastomosis between healthy urethral segments. This approach requires precise mobilization of the urethra and careful preservation of surrounding neurovascular structures to maintain continence and erectile function.

These grafts are used to bridge longer defects and restore urethral continuity. Complications following lower urinary tract reconstruction include stricture recurrence, urinary incontinence, erectile dysfunction, and infection. Stricture recurrence is the most common long-term issue and may require additional intervention. Careful surgical technique and appropriate patient selection are essential in reducing these risks.

Bladder neck involvement in trauma cases adds further complexity. Injury to this region can affect continence mechanisms and may require reconstructive procedures aimed at restoring outlet function. Preservation of sphincter integrity is a key consideration during surgical planning. Long-term follow-up is necessary for all patients with lower urinary tract reconstruction. Assessment includes evaluation of urinary flow, continence status, sexual function, and imaging to detect recurrence of obstruction. Many patients require ongoing monitoring for several years after initial repair.

Rehabilitation following pelvic trauma plays an important role in functional recovery. Pelvic floor therapy and bladder training may assist in improving continence outcomes. Psychological support is also important, as these injuries often have a significant emotional impact due to sudden changes in urinary and sexual function.

CONCLUSION

Reconstruction of lower urinary tract injuries following severe pelvic trauma requires a staged and carefully planned approach. Advances in trauma care and reconstructive techniques have improved outcomes in recent years. Improved imaging, better stabilization of pelvic fractures, and refined surgical approaches have contributed to higher success rates in restoring urinary continuity. Early stabilization, accurate diagnosis, and delayed definitive repair are key principles that contribute to functional recovery and long-term success in these complex cases.

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