Bisphosphonates for Reduction of Urinary Sediment in Patients with Indwelling Catheters

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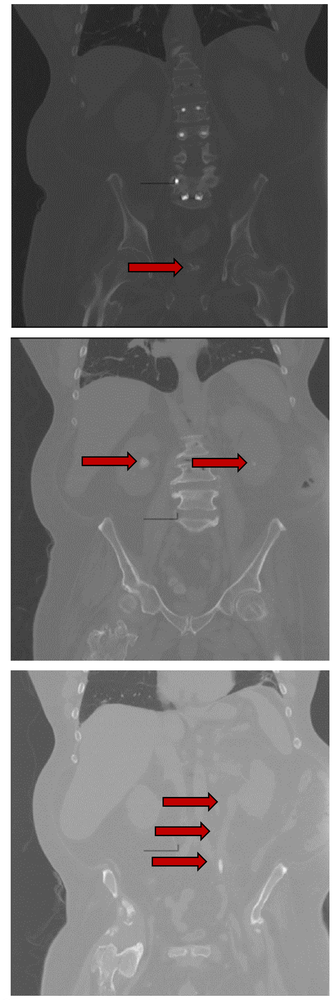
Background

- Urinary tract infections (UTI) are the most common source for sepsis in patients with spinal cord injuries (SCI).[1]
- Urinary caliculi are more common in those with recurrent UTIs, indwelling catheters, and hypercalciuria.[1]
- Bone breakdown contributes to calcium and phosphorus release into the bloodstream, which are then renally excreted and can contribute to stone formation.
- Exchanging catheters in fixed intervals is not recommended; however, catheters with mechanical issues (sediment/stones) must be changed.[3]
- Frequent catheter exchanging increases the risk for UTI; however, clogged catheters increase the risk for vesicoureteral reflux, kidney injury, autonomic dysreflexia.
- Other complications of urinary bladder catheters include epididymitis or orchitis in males, retained catheter parts causing urinary tract obstruction, bladder fistula, bladder perforation.

Case

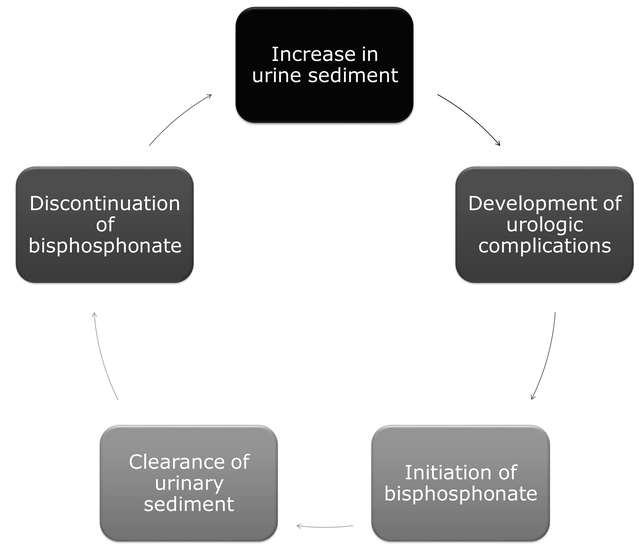
- 64-year-old male with T4 complete SCI secondary to motorcycle crash five years prior. Pre-injury, the patient was very active with weight-lifting, squatting over 200 pounds regularly.
- Two years after injury, he had a suprapubic catheter (SPC) placed for bladder management.
- Within one year of SPC placement, he had undergone multiple urological interventions for frequent urinary sediment and infected bladder caliculi, and his catheter required exchange every 14-17 days.
- When bone density was noted to be low, he was initiated on bisphosphonate therapy. Within 8 weeks of starting therapy, the bladder sediment had resolved, and the frequency of catheter changes was able to be extended to every 4 weeks.
- During a period of strict bed rest, oral bisphosphonate therapy was unable to be administered due to inability to sit upright for 30 minutes to prevent risk of esophageal irritation.[2]
- Urinary sediment returned within two months and SPC exchanges were required every 7-12 days.
- IV zoledronic acid was given and urinary sediment again resolved, allowing for SPC exchanges to extend to 4-week timeframes.

Imaging



CT abdomen depicting dependent bladder stones (top), bilateral renal stones (middle), and left hydronephrosis and obstructive ureteral stone (bottom) in this patient.

Results



Discussion

Complications of Neurogenic Bladder following Spinal Cord Injury:
- UTI
- Urinary Caliculi
- Vesicoureteral Reflux
- Renal Insufficiency

Management of bone density loss after paraplegia:
- Bisphosphonates
- Functional electrical stimulation

Prevention of urinary complications after paraplegia:
- Avoid high bladder pressures
- Prevent incontinence
- Relieve urinary retention
- UTI prevention
- Kidney preservation

Conclusion

It is plausible that slowing the rate of bone demineralization with bisphosphonate treatment may lead to decreased urinary sediment and associated complications.

References

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