HealthNews DIGEST

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Aster HOSPITALS & CLINICS

We'll Treat You Well

Dr. Sherbaz Bichu

CEO & Specialist Anaesthetist
Aster Hospitals & Clinics, UAE

On behalf of Aster's leadership, I am pleased to welcome you to the 21st edition of the HealthNews Digest. Witnessing the constant enthusiasm and commitment towards this initiative is heartening. This monthly newsletter has resulted in the development of a wide spectrum of content for our readers, fostering insights and knowledge that stretch the horizons of the medical sector.

By doing so, the HealthNews Digest has evolved into a crucial platform for Aster to maintain its commitment to clinical excellence and knowledge dissemination. The medical field is constantly evolving, and it is through the joint efforts of our doctors and medical professionals that we are constantly evolving our offerings in patient care.

By continuing to explore unique clinical cases and thought-provoking articles, we can significantly impact patients' lives and continue to raise the bar in clinical excellence.

Dr. Ramanathan V

Medical Director
Aster Hospitals & Clinics, UAE

As the Medical Director for Aster Hospitals and Clinics, I am delighted to greet all our doctors as we commence the 21st edition of HealthNews. It is encouraging to witness their unwavering commitment to tackling complex and challenging cases and thereby improving patient outcomes.

Our tenacity and unwavering resolve in the face of demanding medical challenges exemplify the essence of healthcare excellence. I am confident that the exceptional team of Aster doctors will continue to provide their meaningful contributions to this initiative, broadening our understanding of the medical sector and shaping healthcare's future.

As always, I encourage all our doctors to continue their exceptional feats in medical science and contribute to subsequent HealthNews Digest editions.

A Cautionary Tale of Carbamazepine Induced Hyponatremia treated effectively at Aster Clinic, Al Qusais, Dubai

Dr. Akta Trivedi
Neurology (Specialist)

PRESENTATION

- 35-year-old male
- Known case of Epilepsy and on antiepileptic medication (Levetiracetam 500 mg twice daily) for same.
- Presented with:
  - History of 2 episodes of break through generalised tonic-clonic seizure associated with fatigue for 1 week.
  - Recurrent episodes of focal seizures with secondary generalisation for the last 3 months was reported by family members. The patient was under the care at another healthcare facility, where Oral Carbamazepine 200 mg twice a day was added to the treatment.
  - No recent history of any febrile illness, vomiting, diarrhoea, or shortness of breath
- No family history of similar medical illness

FINDINGS

On Examination:

- Haemodynamically stable
- Conscious and oriented, Central Nervous System examination normal
- No pallor, cyanosis, clubbing and lymphadenopathy

WORKUP

Laboratory investigations were suggestive of **Hyponatremia** with the following values:

- Serum sodium - 125 meq/L (135 meq/L - 145 meq/L)
- Serum potassium - 3.8 mmol/L (3.5 - 5.0 mmol/L)
- Thyroid secreting hormone - 2.3 mIU/L (0.27 - 4.2 mIU/L)
- Serum glucose - 97 mg/dL (<200 mg/dL)
- Blood urea nitrogen - 7.52 mmol/L (2.1 – 8.5 mmol/L)
- Serum creatinine - 0.76 mmol/L (0.5 - 0.9 mmol/L)
- Serum uric acid - 4.91 mg/dL (2.6 – 6 mg/dL)
- Urine osmolality - 317.3 mOsm/kg of water (500-850 mOsm/kg)
- Serum osmolality - 270.27 mOsm/kg of water (275 – 300 mOsm/kg)
- Serum lipid profile - Normal
- Urinary sodium - 49.70 mmol/L
- Serum cortisol - 12 µg/dL (AM: 3.7 - 19.4 µg/dL)

As urinary sodium was more than 20 mmol/L, causes like primary polydipsia and exercise-induced were ruled out. His urine output was around 1.5 L.

The patient was diagnosed with a case of Syndrome of Inappropriate AntiDiuretic Hormone (SIADH) as he presented with clinical euvolemia, with urine osmolality of more than 100 mOsm/kg, and urinary sodium of more than 40 mmol/L with normal thyroid, adrenal, and renal functions. His electroencephalogram (EEG) showed mild generalised cerebral dysfunction.

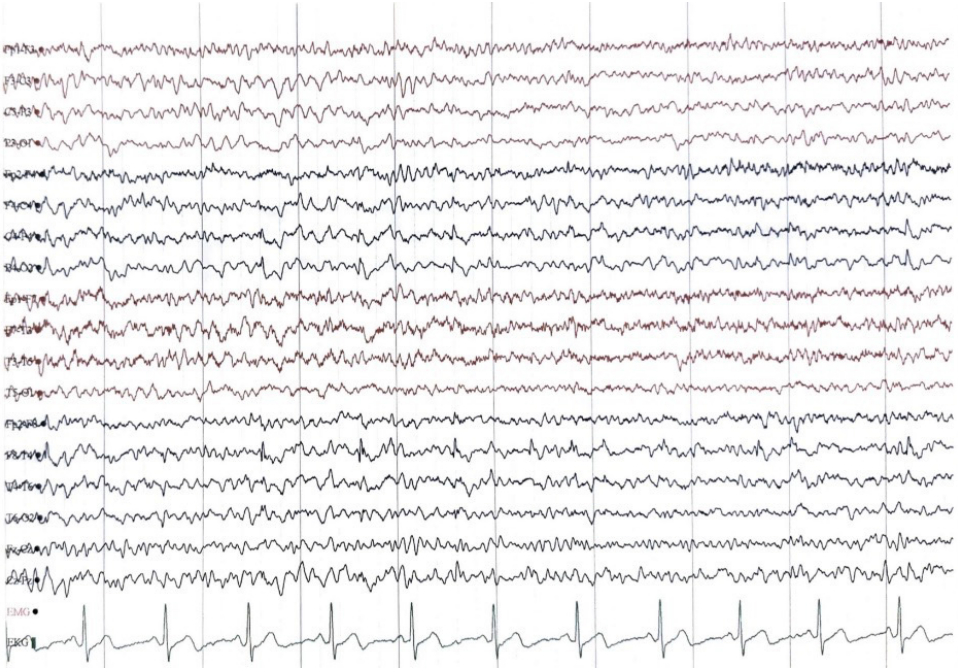
The differential diagnoses were adrenal insufficiency, hypothyroidism, cerebral salt wasting syndrome, hyperlipidemia, and primary polydipsia.

Other causes of the syndrome of inappropriate antidiuretic hormone (SIADH), such as malignancy, pulmonary diseases, and central nervous system pathology, were ruled out by doing relevant investigations along with iatrogenic causes of hyponatremia, hypothyroidism, and glucocorticoid deficiency.

The treatment included stopping carbamazepine as the suspected cause of hyponatremia. The patient was advised of a nephrologist's opinion on the same.

For seizures, oral Lacosamide (50 mg twice daily) was added and for hyponatremia correction, Oral Tolvaptan (30mg once daily) and fluid restriction were advised.

The patient recovered significantly. His serum sodium on day 3 of starting medication was 128 mEq/L. On day 5, it was 130 mEq/L. Thereafter, after 7 days of treatment on follow-up, it was 136 mEq/L and oral Tolvaptan was discontinued.



EEG showing Mild Generalised Cerebral Dysfunction

DISCUSSION

Carbamazepine-induced hyponatremia is a rare condition. The patients may or may not be symptomatic. Carbamazepine is a known antiepileptic and psychotropic agent. It is commonly used for the treatment of seizures, neuralgic pain, and psychiatric disorders.

It is an antiepileptic agent which can cause hyponatremia, but it is rarely documented. Hyponatremia, both symptomatic and asymptomatic, has been found to be directly related to the increased mortality and morbidity of the primary disease (1). Most of the patients of hyponatremia become symptomatic at serum sodium less than 120 mEq/dL approximately (2). Monitoring serum electrolytes, a low-cost blood investigation in symptomatic and asymptomatic patients, is essential to avoid such complications.

Serum sodium less than 136 mmol/L is defined as hyponatremia. Usually, acute-onset hyponatremia occurs in less than 48 hours and is associated with multiple neurological complications such as seizures and coma (3). Most of the patients of hyponatremia become symptomatic at serum sodium less than 120

mEq/dL approximately (2). Hyponatremia has been found to occur in less than 1% of cases of hospitalised patients. As sodium is the primary electrolyte of extracellular fluid and is the dominant factor of serum osmolality, imbalances in serum sodium levels can lead to pathological variations in cellular functions (1,4). Hyponatremia, both symptomatic and asymptomatic, has been found to be directly related to increased mortality and morbidity of the primary disease (1).

There are multiple causes of hyponatremia, such as medications like diuretics, antiepileptics, and antipsychotics. Diuretics are the most common cause of hyponatremia. In this case, hyponatremia was caused by carbamazepine. Carbamazepine is commonly used for the treatment of seizures, neuralgia, and psychiatric disorders.

Carbamazepine-induced hyponatremia is more common in females, patients of age more than 40 years, low baseline serum sodium levels, psychiatric illness, surgery, and hypothyroidism (5,6). This patient had two atypical factors - age and gender and no other associated comorbidities.

Carbamazepine causes an increase in antidiuretic hormone (ADH), which leads to abnormal sensitivity of renal tubules to ADH activity. This causes increased expression of aquaporin 2 channels in the renal tubules (7). The incidence of hyponatremia due to carbamazepine has been found to be 1.8%–40% in previous studies. Although the incidence of hyponatremia with monotherapy of carbamazepine is low, the overall incidence is on the rise (6). Other anticonvulsants causing hyponatremia are oxcarbamazepine and lamotrigine. All these drugs alter the vasopressin levels in the renal tubules (9). The incidence of drug-induced hyponatremia is on the rise as a result of polypharmacy and self-medication, especially in elderly patients (10). In the majority of cases described in the literature, hyponatremia occurred shortly after initiating the treatment, and most of the patients were symptomatic (8,11). However, Fourlanos highlighted a case series of patients with carbamazepine-induced hyponatremia who were asymptomatic at presentation (10).

A few case reports have highlighted the role of genetic predisposition in the development of drug-induced diabetes insipidus. However, this association was not observed in cases of drug-induced hyponatremia, such as diuretics. Thus, it was concluded that patients developing hyponatremia due to diabetes insipidus with one drug can be affected by another drug, affecting vasopressin secretion in the renal tubules (12).

Since epilepsy is considered a social stigma and patients are hesitant to share the history of being on antiepileptic drugs, one can miss this rare cause of

hyponatremia. Drug-induced hyponatremia, although a known entity, is rarely documented. The presence of mild symptoms such as fatigue or dizziness should lead to suspicion and subsequent laboratory testing (13). Patients can suffer from neurologic complications if the imbalance is not corrected. This case highlights the importance of considering the side effects of these often-prescribed medications in specific populations, which physicians can follow up on.

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Comprehensive Strategies for Effective Kidney Stone Management: Scars to the Era of Scarless Stone Surgery

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Kidney stone disease, also known as nephrolithiasis is characterized by the formation of solid crystalline stones in the urinary space of the kidney (1). This condition affects approximately 12% of the global population and is on the rise, with an estimated 1 in 15 people developing kidney stones at some point in their lives (2,3). Multiple factors, such as genetic, metabolic, and environmental factors, contribute to development of the kidney stones (1). Imaging studies are necessary to confirm the diagnosis of kidney stones, while in cases where immediate referral is not warranted, a urine culture and urinalysis are essential to rule out infection (4).

For appropriate treatment strategies, a thorough medical history focusing on the risk factors associated with kidney stone formation is crucial (1). If neglected, kidney stones can progress to a chronic condition with a recurrence incidence of more than 50% after 10 years (5). Dietary control, targeted medicines, and Medical Expulsion Therapy (MET) are all options for treating kidney stones, but larger stones, which can be painful and debilitating, may require surgical intervention (2,6).

This article explores various aspects of kidney stone management, highlighting the importance of a comprehensive approach to minimize recurrence and promote overall kidney health.

CLINICAL PRESENTATION AND EVALUATION OF KIDNEY STONE

A significant number of kidney stones are asymptomatic and are typically detected through imaging; however, each year, 10% to 25% become symptomatic or necessitate intervention (4). The typical symptoms of kidney stones, such as severe pain spreading to the groin, manifest when the stone starts moving down the ureters from the kidneys (2). This pain is commonly characterized as colicky, sharp, and severe, and it results from the peristalsis of the smooth muscle in the genitourinary tract against the stone (2). The other symptoms are illustrated in Figure 1 (2).

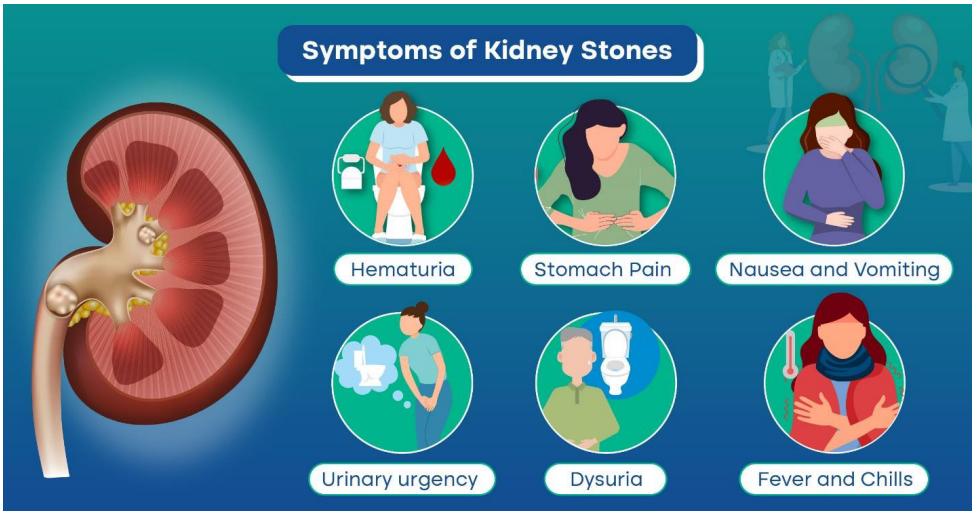


Figure 1 : Common signs and symptoms of kidney stones (1,6)

For diagnosing kidney stones, a comprehensive set of laboratory tests is recommended, including a complete metabolic profile, serum uric acid, serum phosphate, intact parathyroid hormone, and a urinalysis with microscopy (1). If a patient exhibits signs of a urinary tract infection, a urine culture should also be obtained (1). Noncontrast helical Computed Tomography is the preferred imaging method for detecting kidney stones due to its high sensitivity and specificity, its capacity to identify nearly all stone types (except those resulting from protease inhibitors), and its precise determination of size and location (1). While ultrasound has good specificity, its sensitivity is poor (1). This method is utilized in pediatric and pregnant patients to minimize radiation exposure, serving as an excellent screening test for obstruction in the acute setting (1). For patients with documented radiopaque stones, plain abdominal X-ray imaging can be employed to assess stone clearance, recurrence, or growth while minimizing radiation exposure (1).

TREATMENT OPTIONS FOR KIDNEY STONES

The selection of a treatment approach for renal calculi depends on various factors, including stone characteristics (size, number, location, and composition), renal anatomy, and clinical considerations (7). Given the increasing prevalence of kidney stones among younger individuals and the high rates of recurrence, it is crucial to incorporate dietary adjustments, lifestyle modifications, and medical interventions (8).

1. LIFESTYLE CHANGES

Oral rehydration and pain control are essential components of the initial treatment

for all types of kidney stones (9). Pain control is of utmost importance with Nonsteroidal anti-inflammatory drugs (NSAIDs) (2). Additionally, adjusting fluid intake and dietary habits play pivotal roles in managing stone formation (10). A prospective study demonstrated that increasing daily water intake to maintain urinary volume at approximately 2.5 liters was linked to decreased urinary supersaturation with calcium oxalate and a notable reduction in stone recurrence (5).

2. MEDICAL EXPULSIVE THERAPY (MET)

Approximately 86% of kidney stones pass on their own, with a lower rate observed for stones larger than 6 mm (59% compared to 90% for smaller stones) (4). While urologists frequently remove larger stones exceeding 6 mm, these are the ones that have greatest benefit from MET (4). The most common medications employed for MET are α-1 blockers and calcium channel blockers (10).

- **Alpha blockers**

  MET with alpha blockers (e.g., tamsulosin, silodosin) increases the possibility of stone passing, alleviates discomfort, and avoids surgical procedures and hospitalizations (4). In a trial of tamsulosin in renal colic, the treatment group had a 100% expulsion rate whereas the control group had 70% (8). The average expulsion time in the treatment group was 65.7 hours, compared to 111.1 hours in the control group (8).

- **Calcium channel blockers**

  Nifedipine, a calcium channel blocker, has demonstrated the ability to relax ureteral smooth muscle in vitro, with its predominant effect observed in the distal ureter (10). In a study investigating combined therapy using nifedipine and deflazacort for distal ureter stones, the treatment group exhibited a 79% stone expulsion rate, compared to only 35% in the control group (8). The average stone size was 5.8 mm for the treatment group and 5.5 mm for the control group (8).

3. SURGICAL TREATMENT OF KIDNEY STONES

Patients who fail to pass a stone within 2 to 4 weeks of outpatient monitoring, those with complicating factors such as fever, uncontrolled pain or nausea, or a solitary functioning kidney, should consider surgical procedures (11). Stones larger than 6 mm are likely to necessitate intervention, with minimally invasive treatment options including SWL, ureteroscopy (URS), percutaneous nephrolithotomy (PCNL), and retrograde intrarenal surgery (RIRS) (2,12).

- **Extracorporeal Shock Wave Lithotripsy (ESWL)**

ESWL involves using shock waves to break down stones into smaller fragments that pass naturally within several days or weeks (6). For renal and ureteral stones

smaller than 2 cm, SWL is considered a suitable initial treatment, especially in non-staghorn calculi (13). In cases where general anesthesia is not feasible, SWL may be considered for larger stones, as it can also be performed under local anesthesia or intravenous sedation (13). A retrospective study concluded that ESWL is safe and effective for treating moderate-sized kidney stones with a stone area (SA) of 100–300 mm^2, recommending it as the primary approach for such cases (14).

- **Ureteroscopy (URS)**

This is an endoscopic procedure performed transurethrally allows for the extraction and fragmentation of stones using laser techniques (15). URS is particularly advantageous in coagulopathic, pregnant, or morbidly obese patients for whom SWL or PCNL may be ineffective or contraindicated (7). In a study aimed at assessing the effectiveness of simultaneous flexible ureteroscopic removal of ureteral and ipsilateral renal stones, it was found that Flexible URS can be concurrently considered for both ureteral and renal stone types in selected patients (16). Flexible URS offering a favorable option with a high likelihood of achieving a stone-free status and minimal complications, especially for patients with a stone burden <100 mm^2 (16).

Another study focused on evaluating the effectiveness of flexible URS in patients with multiple unilateral renal stones (17). The findings indicated that flexible URS is an effective treatment option in such cases, providing high single-procedure stone-free rates with only a low incidence of minor complications (17).

- **Retrograde Intrarenal Surgery (RIRS)**

Retrograde intrarenal surgery (RIRS), utilizes a fiberoptic endoscope, stands out as the least invasive method for performing kidney surgery (12). Studies have shown an impressive 82.1% stone-free rate for lower pole stones with RIRS (18). A comparison between miniaturized percutaneous nephrolithotomy (mini-PCNL) and RIRS for renal stones larger than 10 mm demonstrates both procedures as safe and has similar stone free rate (19). Additionally, another study evaluated the safety and efficacy of PCNL and RIRS in the Management of Renal Stones more than 2 cm in diameter (20). This study emphasizes the acceptability of RIRS efficacy, early return to work, less bleeding complications and underscored its safety, making it a superior alternative for managing renal pelvic stones larger than 2 cm in diameter (20).

- **Percutaneous Nephrolithotomy (PCNL)**

Although PCNL is considered more invasive, it may be necessary for the removal of large stones or those that cannot be extracted cystoscopically (6). This procedure involves direct percutaneous access to the kidney using a needle and guidewire

(15). Typically, PCNL is reserved for cases where SWL or RIRS fails or for patients who are not suitable candidates for lithotripsy (7). According to recommendations from both the American Urological Association (AUA) and the European Association of Urologists (EAU), PCNL is the preferred treatment for renal stones larger than 20 mm due to its higher success rate in achieving stone-free status (21). A meta-analysis comparing various treatment methods for renal stones found that PCNL had the highest stone-free rate along with lower rates of auxiliary procedures and retreatments, indicating its safety and efficacy, especially for large staghorn renal stones (22).

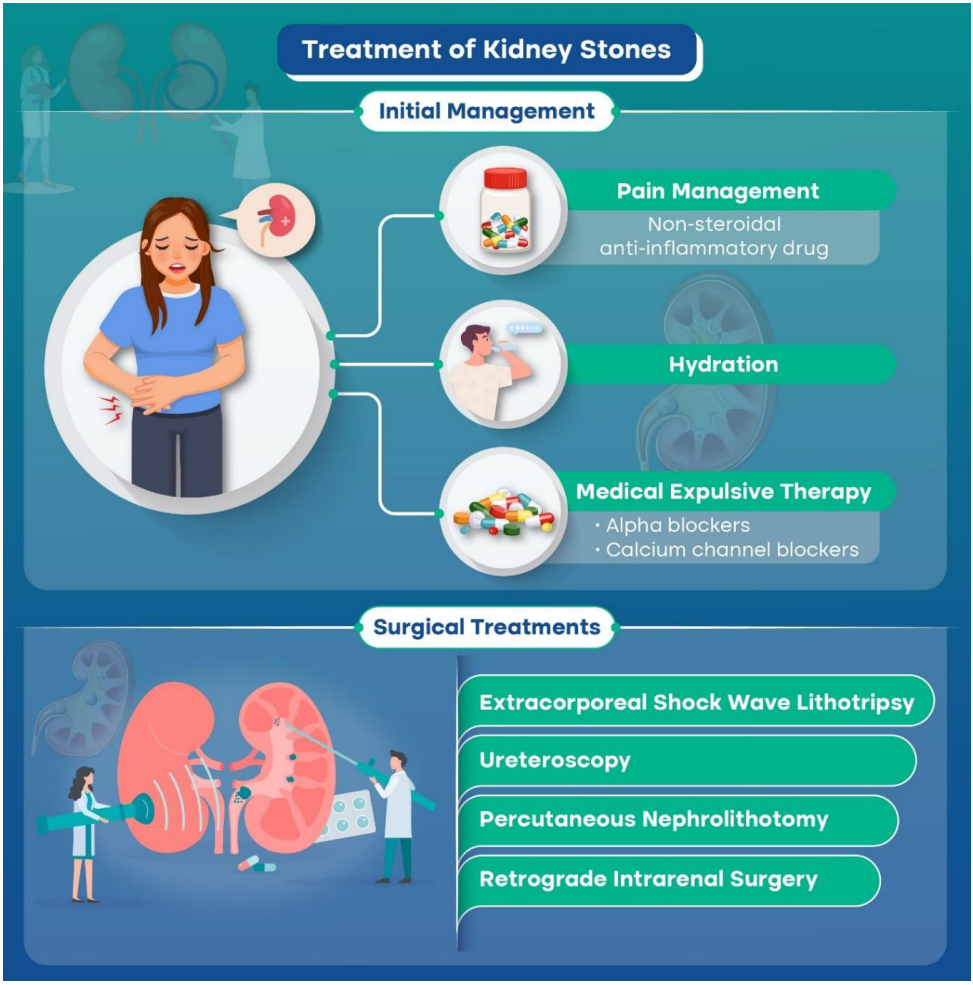


Figure 2: Approaches to managing kidney stones (2,4,10,12)

MEDICAL AND DIETARY TREATMENT - PREVENTIVE THERAPY

Stone formation can be a recurring condition, posing significant risks such as chronic kidney disease (CKD), metabolic bone disease (MBD), and end-stage renal disease (ESRD) (23). Therefore, individuals experiencing recurrent stone formation should undergo an evaluation to identify any treatable metabolic causes of kidney stones (6). This evaluation is guided by the results of a 24-hour urine collection (6).

Preventing recurrence necessitates a multifaceted approach involving behavioral modifications, nutritional adjustments, and specific pharmacological treatments tailored to the type of stone, such as calcium stones, uric acid stones, cystine stones, or struvite stones (23).

Adequate fluid intake is paramount in this treatment regimen, with adjustments recommended to ensure a urine output exceeding 2.5 L/day (6). Figure 3 illustrates the detailed guidance provided by both the AUA and EUA, on pharmacological measures depending on the stone composition and metabolic status (11,21).

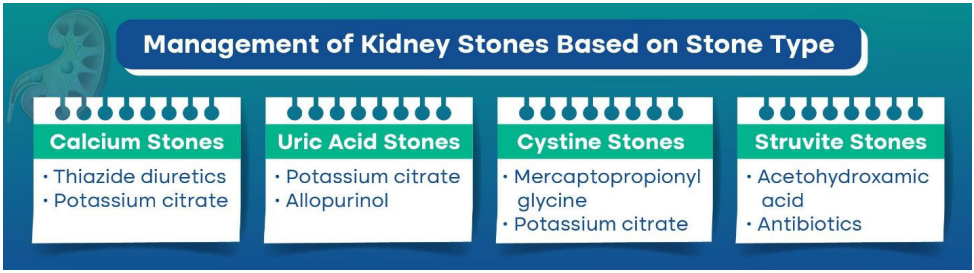
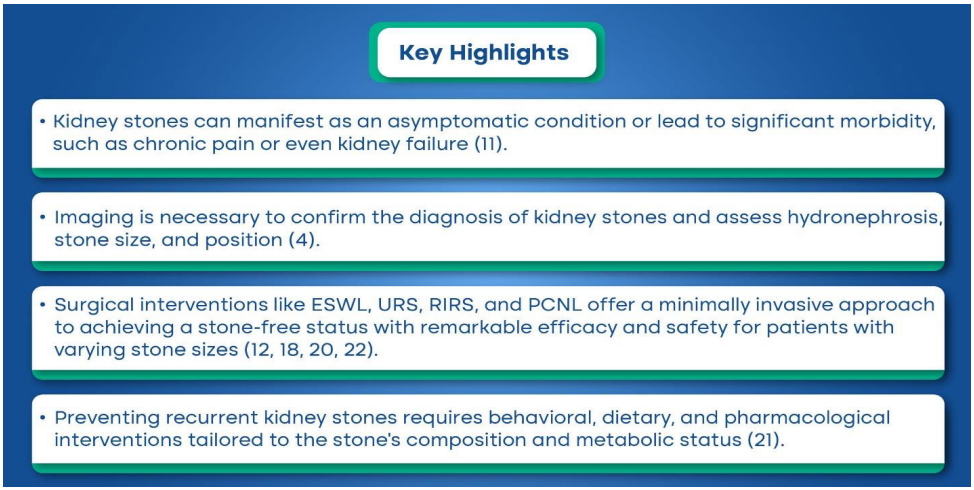


Figure 3: Strategies for the prevention of specific types of stones (21,23).



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Occult Hip Fracture of Right Femur identified and treated successfully at Aster Hospital, Sharjah

Dr. Brijesh Puthalonkunath Valsalan
Orthopaedics (Specialist)

PRESENTATION

- 67 year old male
- History of fall 12 days back from stairs in Oman
- Patient consulted two specialists initially with no improvement in the condition
- Visited Aster after 12 days of fall for further management
- No comorbidities
- Admitted with –
  - Severe pain in the right hip for 12 days
  - VAS Score - 8/10
  - Inability to walk
  - X-ray done in another centre showed **no hip fracture**

FINDINGS

The patient was unable to stand up and was brought in a wheelchair.

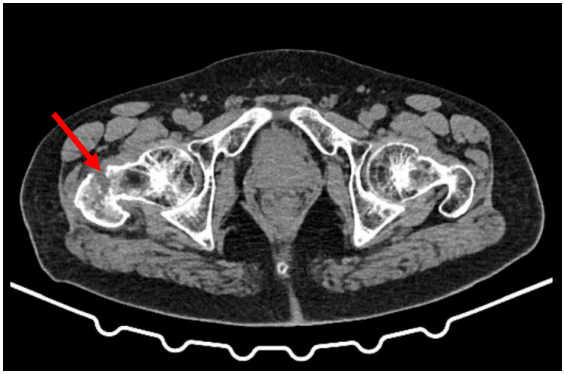
During Examination:

- Right hip – Tenderness, ROM painful rotations, mainly internal rotations.
- Ecchymosis.
- Right limb was in an externally rotated position compared to the other side.
- Discrepancy of 1 cm limb length with shortening on the right side.
- Distal pulse posterior tibial was well felt on both sides.
- Dorsalis pedis artery (DPA) seen well palpable in the left but feeble on the right side.
- Actively moving ankle and toes, with sensation intact.

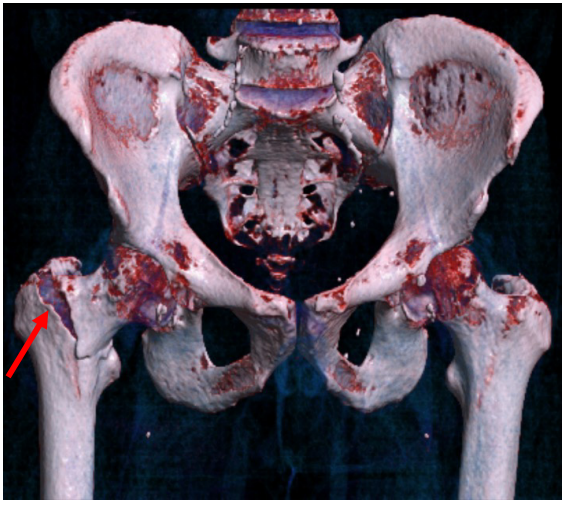
CT Pelvis:

CT scan of the pelvis with both of the hip joints was performed with coronal and sagittal reconstructions that showed:

- An oblique mildly displaced intertrochanteric fracture was seen in the right femur with a fracture fragment displacement of ~7.0 mm.
- Generalised reduction of bone density was seen.
- Mild hip joint space reduction was seen bilaterally on the superolateral aspect.
- Sacrum bilateral iliac bones and the visualised part of the left proximal femur appeared normal.



CT Axial Cut showing Fracture



3D CT image showing Fracture

As clinical examination showed a difference in dorsalis pedis pulse on the right side, a Doppler Study was conducted.

Doppler Study of Right Lower Limb Arterial System:

B-mode grey scale imaging colour and spectral imaging of the right lower limb arterial system was done using the high-resolution probe that showed:

- The common deep, superficial femoral, popliteal, posterior tibial, anterior tibial, and peroneal arteries showed a normal triphasic spectral pattern.
- Peak systolic velocities with calcified plaques at the bifurcation of the right common femoral artery and midportion of the right superficial femoral artery causing ~25-30% stenosis.
- Intimal thickening and haemodynamically insignificant calcific plaques were also seen throughout the right anterior and posterior tibial arteries; however, flow waveform and plasticity were maintained.
- The dorsalis pedis posterior tibial arteries at the ankle showed normal luminal colour, filling triphasic spectral patterns and peak systolic velocities.
- No evidence of deep venous thrombosis was seen in the deep veins of the right leg.

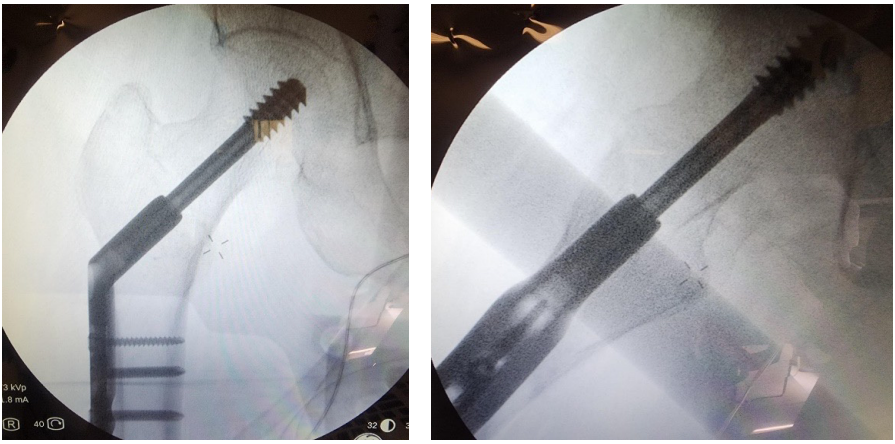
DIAGNOSIS

- Displaced Intertrochanteric Fracture of Right Femur.
- Peripheral Vascular Disease.

DURING PROCEDURE

The patient was admitted with displaced per trochanteric fracture in the right hip and underwent pre-op evaluation, and then was posted for DHS (Dynamic Hip Screw) Fixation:

- Lateral approach to the hip was made, and dissection was done in layers.
- Bone was exposed, and a guide pin was inserted to ensure a central position in both AP and lateral views under c-arm guidance using a 135-degree angle guide.
- Pin was advanced to subchondral bone, and 2nd pin was inserted parallel and superior to 1st pin to prevent fragment rotation.
- The length was measured.
- Triple reaming was done, and DHS was advanced to lie 10 mm short of the chondral surface. AP and lateral views were checked to ensure the tip apex distance was within an acceptable range.
- 3-hole side plates were inserted and fixed with 3 screws, 1 cortical, and 2 locking screws.
- The construct was stable, with a good reduction of fractures in both planes.



(a) (b)

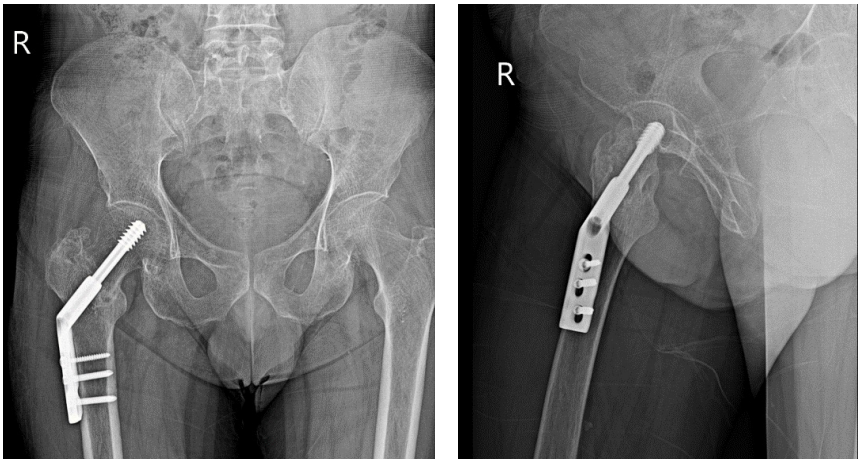
Intra-operative C-arm images in (a) Anterior-Posterior and (b) Lateral views

POST PROCEDURE

The postoperative period was uneventful. The patient was made to ambulate with walker support and allowed to bear full weight according to his pain tolerance.

He was discharged in a clinically stable, non-painful condition. The wound was cleaned, and the dressing was changed.

He was ambulating with walker support, and physiotherapy was performed.



(a) (b)

Post-op 6-week follow-up images in (a) Anterior-Posterior and (b) Lateral views

DISCUSSION

Hip fractures in the elderly represent a significant healthcare challenge globally, especially in those countries where the proportion of the elderly population has continued to rise over the last decade.

Hip fractures can have considerable morbidity and mortality if timely diagnosis and appropriate management are not carried out. It presents with anterior groin pain and inability to bear weight, and if displaced, they come with classical signs like shortened, abducted, externally rotated limbs. However, non-displaced fractures can present with only hip pain, and some high index of suspicion needs to be maintained in any hip pain following a history of falls in elderly patients.

Plain radiography is usually sufficient for diagnosis, but CT/ MR imaging should be obtained if suspicion of fracture persists despite routine radiography. Modern CT techniques are not inferior to MRI in detecting occult fractures and may be a suitable alternative in the absence of a cancer history if an MRI cannot be obtained timely or is contraindicated.

Operative management within 24 to 48 hours of the fracture optimises outcomes. Based on fracture type and location, fractures are usually managed by surgery, using spinal or general anaesthesia. Nonsurgical management can be considered for patients who are not good surgical candidates.

The current case illustrates the importance of remaining vigilant about the possibility of occult hip fractures despite routine radiography and investigating further to identify early and manage appropriately to avoid complications due to delayed or denied treatment.

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A Brief Insight into Lumbar Back Pain, Diagnosis, and Treatment Measures

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Lower back pain (LBP) of the lumbar disc region is a common disabling symptom affecting people of various ages everywhere (1). Approximately 619 million people suffer from lower back pain worldwide, with a notable prevalence at 45-54 years and an increase among both sexes at around 80-84 years (2). Overall, the global prevalence is higher in women than in men (2). LBP is described as pain, stiffness, and tension in the muscles with or without leg pain (3). The lower back comprises of the five lumbar vertebrae (L1-L5), and most acute lumbar back pain arises from damage to the lumbar vertebrae and adjoining structures (4). It is crucial to address lower back pain promptly, as untreated and poorly diagnosed lower back pain has the risk of progressing into chronic pain; about 20% of individuals with low back pain develop chronic lumbar back pain after one year (5).

This article discusses the causes, diagnostic modalities, and treatment approaches employed for lumbar back pain.

COMMON CAUSES OF LOWER LUMBAR BACK PAIN:

The etiology of LBP is multifactorial, and it can be categorized as spinal back pain, which is due to skeletal irregularities, degenerative conditions, autoimmune diseases like osteoarthritis, spinal cord problems and trauma to the spine (6). Non-spinal causes envelop kidney stone, pregnancy, endometriosis, fibromyalgia, and tumors of the spine (6).

1. Intervertebral Disc Related Issues:

Intervertebral disc (IVD) diseases and their associated pathologies are a common cause of lower back pain, affecting both the young and old population (7). The prolapsed disc can cause pain through inflammatory reactions, while degenerative discs disease can worsen the pain during flexion and when carrying heavy load (7). Furthermore, disc herniation causes radiating pain from the lumbar region to the legs, along with urinary and bowel continence (7).

2. Arthritic Conditions:

Facet joint arthritis (FJA) and osteoarthritis (OA) are two major contributors of LBP (8). The facet joint and intervertebral disc forms a crucial part of the spinal movement section, and injury to this joint results in FJA (8). Overtime, the degenerated joint becomes hypertrophied, forms synovial cysts, and extension of osteophytes over the joint, which can lead to lumbar radiculopathy and therefore pain (9). The lumbar joint is one of the most commonly affected sites by OA, and patients with spinal OA often have a history of lower back injury (10). Osteoarthritis in the lumbar region causes radicular pain extending to the knee which indicating nerve root irritation leading to motor, sensory and reflex defects (10).

3. Muscular Strains and Sprains:

Lumbar muscle strain is a diffuse and dull pain of the waist and the region above the iliac crests (11). Strenuous activity, poor posture, or sports activity are the primary cause of lumbar strain and injury leading to microtrauma to the lumbar supporting structures (12). This provokes a neurohumoral response that aggravates lumbar pain (12).

This type of pain might spread to the buttocks or thighs and maybe be associated with cold limbs, visceral pain, which also affects the sitting tolerance of such patients (11).

4. Spinal Stenosis:

Spinal stenosis is another degenerative condition that affects the IVDs, spinal joints and ligamentum flavum (13). It causes narrowing of the spinal canal and compression of the neural tissue and causes lower back pain, neurogenic claudication, radiating pain of the lower limbs and urinary continence (13). As the stenosis progresses joints become hypertrophied and ankylosed (13).

5. Scoliosis:

Scoliosis affects the spine and trunk of individuals and has no underlying cause (14). It can be present in adolescents, elderly or get diagnosed after skeletal maturity (14). Patients generally experience asymmetric lower back pain centered around the apex of the spinal curve, located either on the side of the spinal prominence or the concave area (14). The pain is localized in the lumbar region but sometimes present in thoracolumbar and thoracic spine (14).

6. Non-spinal Causes of Lumbar Back Pain:

Pregnancy is a common cause of back pain, with approximately 50% of women suffering from back pain during pregnancy and even after birth (6). Spinal tumors and metastasized tumors can cause vertebral collapse and spinal cord compression consequently leading to pain (6). Sharp pain in the back may also be

observed in patients with kidney stones and urinary infections (6). Additionally, fibromyalgia can be another contributor to lumbar pain (6).

CLINICAL DIAGNOSIS OF LUMBAR BACK PAIN:

Diagnostic tests can be classified as anatomical, functional and physiological (15). Anatomical tests employ MRI, CT, myelography and roentgenograms that aid in visualizing the joint anatomy (15). Functional tests evaluate the patient's lifting, pushing, and pulling capacities (15). While, physiological tests involve procedures like electromyography and discography (15). Few methods and their features are listed below:

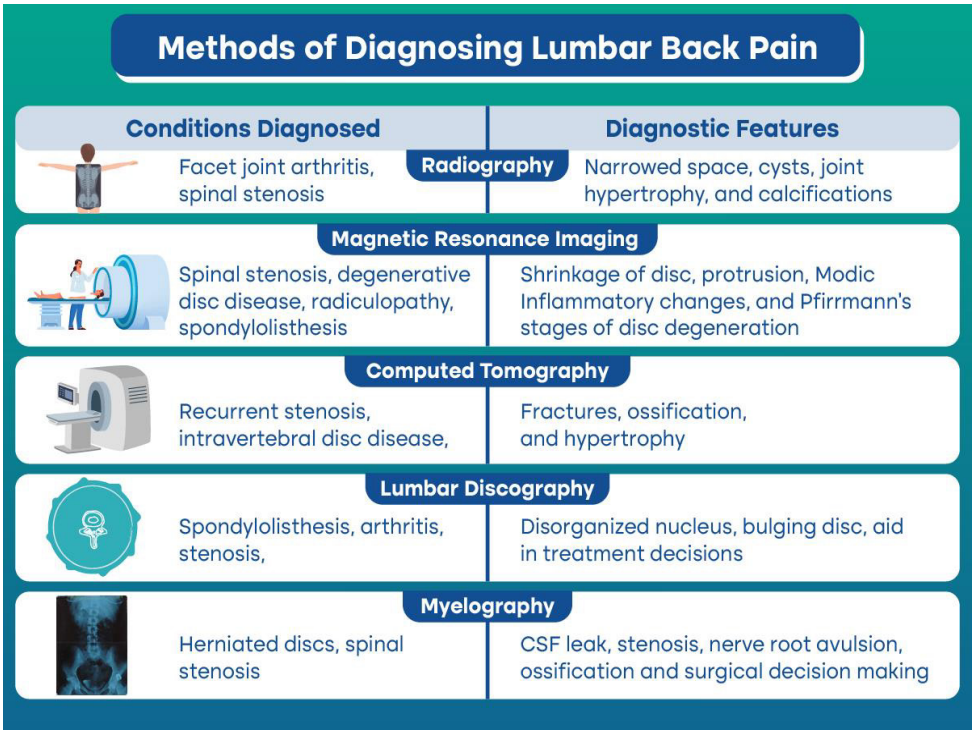

Table 1: Diagnostic Approaches and Features Of Lumbar Back Pain (1,7,15–18)

MANAGEMENT AND TREATMENT APPROACHES FOR LUMBAR BACK PAIN:

Treatment for lumbar back pain includes conservative management with exercises and manual therapy, as well as pharmacological treatment with anti-inflammatory drugs (19). In severe cases, surgical options may be considered (20,21). Here are a few strategies for managing lumbar back pain:

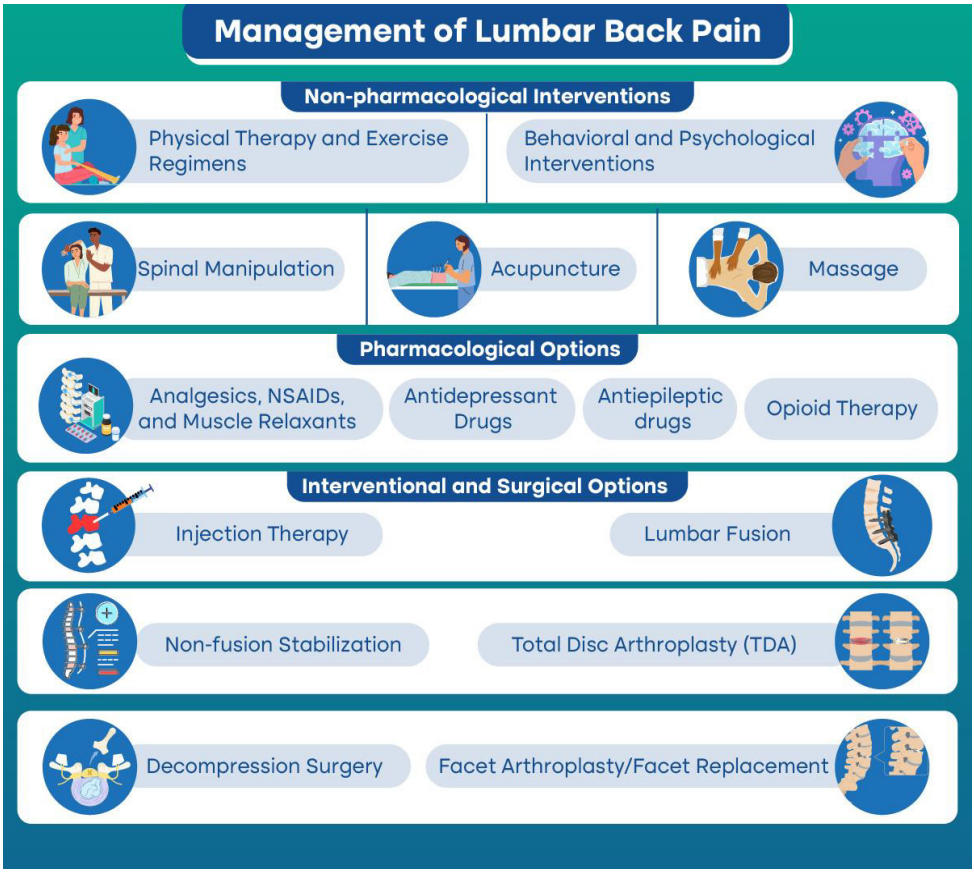

Table 2: Treatment Modalities of Lumbar Back Pain

A. NON-PHARMACOLOGICAL INTERVENTIONS:

Treatments under this section include physical activities such as exercises, movements and psychological interventions to improve the function and prevent the lumbar pain from getting worse (19,20).

- **Physical Therapy, Exercise Regimens, and Lifestyle Changes:**

The first line care recommended to patients is to stay active in life and pain medication if necessary (22). Exercise helps to improve mobility, strength, endurance, and functional disability (23). Various exercises target the lumbar region to improve stabilization and core strength (23). Lumbar exercises can be personalized based on the lumbar pain of each individual (23). The World Health Organization recognizes the impact of lifestyle behavioral changes of lumbar pain

and quality of life (24). Lifestyle modifications include nutrition, restorative sleep, mitigate addiction, physical activity and a healthy BMI (24).

- **Behavioral and Psychological Interventions:**

Harboring a positive and optimistic behavior is associated with less pain intensity and can be an important factor in resilience to lumbar pain (24).

In a trial comparing mindfulness-based stress reduction to standard care (scored as 0-10), individuals receiving mindfulness-based treatment demonstrated significantly greater improvements in short-term back pain, showing a difference of -0.64 points, as well as enhanced function, with a difference of -1.37 on the Roland Morris Disability Questionnaire (RDQ scale) (25). Moreover, they exhibited a higher likelihood of experiencing a 30% or more reduction in pain (relative risk, 1.64 [CI, 1.15 to 2.34]) and improved function (relative risk, 1.37 [CI, 1.06 to 1.77]) (25).

- **Spinal Manipulation:**

This technique includes both spinal manipulation and mobilization (26). In manipulation, the therapist applies a physical thrust to the joint at or near the physiological range of motion (26). In contrast manual mobilization uses slow and passive movements starting from a smaller range of motion to a larger range of motion (26).

It combines biomechanical and neurophysiological action (27). The biomechanical approach focuses on a manipulable or functional spinal lesion and reduces internal mechanical pressure (27). The neurophysiological method targets the sensory neurons of the paraspinal tissue and the motor control system (27).

- **Acupuncture:**

Manual acupuncture may encompass the traditional Chinese medicine that adhered to energy and philosophical healing as well as dry needling which is a western medicinal practice (28). This method activates certain endogenous pain control systems of the body to stimulate the release of opioid hormones like serotonin and catecholamines (29).

Electrical acupuncture combines acupuncture as well as electric stimulus for quicker anesthetic and analgesic action against pain (29). A single blinded, randomized controlled trial demonstrated both methods of acupuncture to be equally effective in reducing pain and disability of lumbar back pain (29).

- **Massage:**

Massage is a safe and effective therapeutic approach for symptomatic relief of pain (30). It is a form of spinal manipulation of the soft tissue for relief of muscular pain and body aches (30). Soft tissue massage alleviates pain by physical and mental relaxation, it increases pain tolerance by the release of endorphins (30).

Although effective, massage therapy may not be suitable in acute inflammation, non-consolidated fractures, infection, deep vein thrombosis or sites of active cancer (30).

B. PHARMACOLOGICAL OPTIONS:

In cases of inadequate response to first-line therapy, pharmacological treatments are recommended (20).

- **Analgesics, NSAIDs, and Muscle relaxants**

Acetaminophen is a widely used analgesic due to easy access, and is used for the management of lumbar pain, however its effectiveness is not different than placebo groups (20,31). The lowest effective dose of non-steroidal ant-inflammatory drugs (NSAIDs) with gastroprotective therapy is recommended.(20). NSAIDs provide short-term improvement of pain intensity and severe muscle spasms (20). Pain of myofascial origin can be managed by a combination of myorelaxants, acetaminophen and NSAIDS (20).

- **Antiepileptic Drugs:**

Gabapentin and pregabalin are prescribed for neuropathic pain, which may help in managing the lumbosacral radicular pain and neurogenic claudication (20). These medications are recommended for patients with chronic back pain with a neuropathic component (20). However, long-term use of these drugs can lead to side effects such as confusion and potential addiction (20).

- **Antidepressant Drugs:**

Duloxetine has shown superior effectiveness compared to analgesics and placebo in managing chronic back pain and it is recommended for managing pain with neuropathic component and in pain with concomitant depression (20). However, antidepressants are not included in the current treatment guidelines (20).

- **Corticosteroid Injections:**

Epidural corticosteroid injections has shown immediate pain improvements in radicular pain sometimes with functional pain, however, the effect is not sustained (7). Corticosteroids do not help in relieving pain of spinal stenosis, FJA and non-radicular pain (7).

- **Opioid Therapy:**

Opioids are recommended for short term therapy in selected patients (20). It is effective in relieving pain and improving functionality for short term use (20). Although, its routine use is unsuitable due to the risk of overdose and drug abuse (20).

C. INTERVENTIONAL AND SURGICAL OPTIONS:

Individual with persistent pain of more than 6 months, who have not responded to conservative management and pharmacological treatment and observe new radicular pain should seek a spinal surgeon (21).

- **Injection Therapy:**

Local anesthetic and steroid injection are the first-line invasive therapy offered to a patient (21). It is administered as a temporary measure to suppress the inflammatory cycles and reduce pain (21). The injection may be administered into the facet joints, epidural space or around the nerve root (21). This is beneficial for targeting radicular pain, and pain due to spinal stenosis (21).

- **Lumbar Fusion:**

In this procedure two vertebras are fused together so they may function as a solid bone (21). The aim of spinal fusion surgery is to prevent excessive movement of the joint responsible for pain (21). Types of fusion surgery include anterior lumbar interbody fusion (ALIF) and posterior lumbar interbody fusion (PLIF) (21).

- **Non-fusion Stabilization:**

This method employs stabilizing the spine with flexible materials with an aim to reduce the flexion and extension of a specific region of the spinal cord (21). Devices include Graf ligament, less invasive interspinous stabilizers like Dyneses systems such as Wallis ligament, Coflex, and DIAM which fill the interspinous space and eliminate the need for pedicle screws (21).

- **Total Disc Arthroplasty (TDA):**

This method overcomes the limited motion faced by patients after undergoing spinal fusion (21). TDA preserves the joint movement and transfers the load bearing function to the prosthesis (21). It requires less muscle dissection and shows less perioperative pain (7). Disc arthroplasty may be performed for disc collapse, degenerative disc disease without spinal stenosis (7).

- **Decompression Surgery:**

The main types of decompression surgery include discectomy and laminectomy (7). Laminectomy includes completer or partial removal of the ligamentum flavum and excising the pathological elements (7). Discectomy as well as laminectomy are useful in IVD, disc herniation and spinal stenosis (7). Decompression surgeries are indicated when conservative measures fail and in cases of recurrent hernias (7).

- **Facet arthroplasty/facet replacement:**

The articulating facets of the joint are replaced by a prosthesis through a posterior approach (21). It provides quick alignment, stabilization and restores spinal motion (21). Dynamic stabilization is an alternative to lumbar fusion and reduces the incidence of adjacent level diseases (16). Facet arthroplasty is useful for grade 1 spondylolisthesis with stenosis (16).

Key Highlights

- Lumbar back pain is a disabling condition with multifactorial etiology that limits patients quality of life (6). It can be due to sudden sharp pain due to stress or a dull pain that progresses with age (4).
- Since lumbar pain has no defined pathology correct identification of the causes can be made by radiography, MRI, CT imaging, etc to ensure appropriate treatment (15).
- Treatments are aimed to improve joint function, mobility, relieve kinesiophobia, and prevent further deterioration (32).
- Therapies should be tailored to patient's age, comorbidities, severity and neural elements of lumbar pain (8,12).

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Successful Removal of a 26-year-old Perforated and Trans-migrated Copper-T Intrauterine Contraceptive Device (IUCD) at Aster Hospital, Mankhool

PRESENTATION

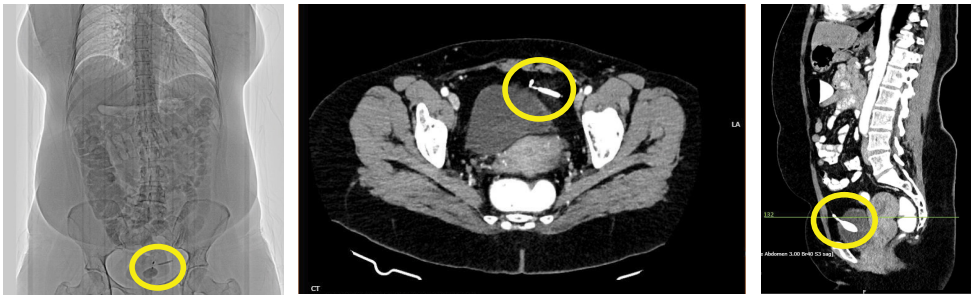
- 51 year old female
- Medical history of IUCD 26 years back, four children out of which 2 are after IUCD insertion and Appendectomy 9 years back
- No significant family history of any medical illness
- Referred from Aster Clinic to Aster Hospital for further medical management
- Admitted with:
  - Complaints of left lower abdominal pain for 1 month
  - Severe dysuria and irritative lower urinary tract symptoms

FINDINGS

During Examination:

- Ultrasound KUB showed Large Vesical Calculus - 3.6 x 2.7 cm hanging from the anterior wall of the bladder.
- CT Urogram revealed:
  - Prevesical space IUCD towards the left, one short arm embedded into the vesical lumen.
  - An intravesical calculus - 2.9 x 2.8 cm / 1500 HU seen adherent to the intraluminal arm of the IUCD.

- Mild adjacent vesical wall thickening. No evidence of ascites / extraperitoneal fluid / collections.

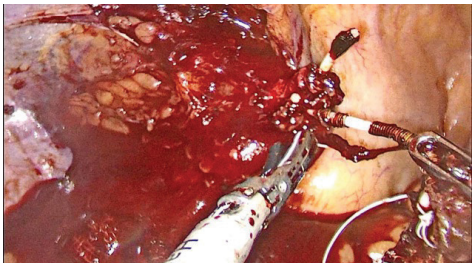


CT images showing Migrated IUCD with attached Calculus

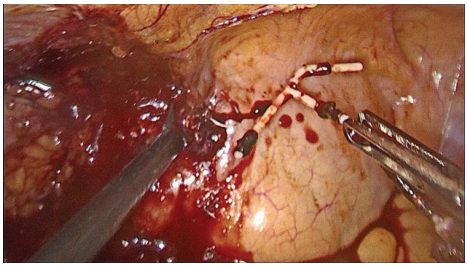
DURING PROCEDURE

The patient underwent Cystolitholapaxy + Laparoscopic removal of IUCD and repair of Bladder defect under general anaesthesia:

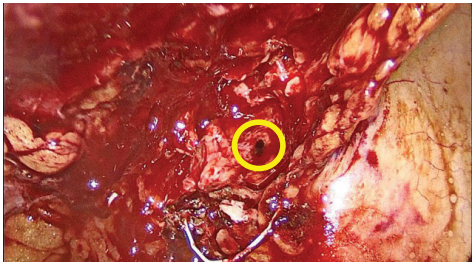
- The patient was placed in the dorsal lithotomy position.
- 26 French 30-degree cystoscopy was done.
- Perforated IUD was seen at the 1'o clock position in the anterior bladder wall with a large 3 cm calculus attached to it.
- Cystolitholapaxy was done with a cysto-nephroscope, and all fragments were evacuated.
- Patient was then placed in a steep Trendelenburg position. 10 mm umbilical port and two 5 mm ports were placed at the junction of the MCL and spinoumbilical line on either side.
- Anterior peritoneum was incised to enter the Retzius space.
- IUCD was seen in the Retzius space densely adherent to surrounding tissues.
- Combination of blunt and sharp dissection was done, and the IUCD was released from surrounding tissues and removed.
- A 5 mm rent was made in the bladder during the process of releasing the IUCD, which was repaired with 3-0 Vicryl stitches.
- Bladder integrity was checked by filling the bladder with Methylene blue.



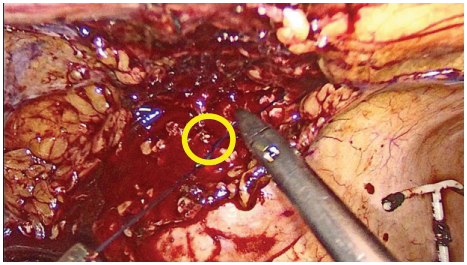
The IUCD being dissected off surrounding Dense Adhesions



The IUCD dissected free off the Bladder



Bladder Defect after removal of the IUCD



Repair of the Bladder Defect after removal of the IUCD

POST PROCEDURE

The patient tolerated the procedure well and made an uneventful recovery. She was discharged after 24 hours with a urinary catheter. The catheter was removed after 1 week.

DISCUSSION

Intrauterine contraceptive devices are the most popular method of reversible contraception due to their high efficacy for fertility regulation, low-risk, and low-cost (1). Complications with IUCDs remain rare. These include spontaneous abortion, pelvic inflammatory disease, uterine perforation, heavy bleeding, dysmenorrhea, and unplanned pregnancy.

The rate of uterine perforation has been estimated to be between 0 and 60/10,000 insertions. The pathogenesis of uterine perforation of IUCD may occur by two mechanisms:

- Uterine perforation can occur at the time of insertion, especially when associated with severe abdominal pain (2,3,4).

- Gradual pressure necrosis of the uterine wall by IUCD (likely at its lead point) with a controlled perforation and gradual migration out of the uterus.

Pregnancy helps in the erosion of the uterine wall with IUCD, and therefore, secondary perforation is considered to be the most likely mechanism (1). Our data supports this hypothesis, as a pregnancy occurred after the insertion of IUCD. About 80% of uterine perforations are free in the peritoneal cavity. IUCD migration into adjacent organs leads to bowel obstruction, perforation peritoneal, appendicitis, vesical calculus formation, obstructive nephropathy, fistula formation, and intraperitoneal adhesions leading to infertility (2,5,6).

Intravesical migration of IUCD with secondary calculus formation is an extremely rare complication of IUCD insertion (7-12). To date, approximately 80 cases of IUD migration to the bladder have been reported in the literature, and about half of them resulted in stone formation, with stone sizes varying from 1 to 8 cm. The foreign material within the bladder, especially copper incorporated in a CuT, elicits an inflammatory reaction and acts as a nidus for stone formation. The infections constitute a separate predisposing factor (8).

The device can either be partially or entirely encrusted with calculi (2). Sonography with transabdominal and transvaginal is a useful method to detect IUCD migration and calculi encrustation, which can be well-diagnosed by the presence of calculus in plain X-ray KUB.

In our case, the unusual position of the bladder stone, which appeared to be hanging from the anterior wall, led to further investigation with CT Urogram. Computed tomography is an effective imaging modality in demonstrating IUCD relation with adjacent structures. Magnetic resonance image further delineates fistulous tracts between the uterine and urinary bladder.

Treatment options for IUCD removal vary. Cystoscopic extraction of the device and stones is preferred as there is less morbidity with a high success rate if the IUCD is completely in the bladder.

In this case, Exploratory laparotomy, and removal of the device along with the stone and repair of the bladder was the standard treatment as the stone was in the bladder and the device was outside the bladder. We opted for a minimally invasive approach, wherein the stone adherent to the IUCD was fragmented and evacuated cystoscopically. The patient was then approached laparoscopically, the device removed, and the bladder repaired. This approach helped reduce the recovery time, hospital stay and early return to the patient's everyday life.

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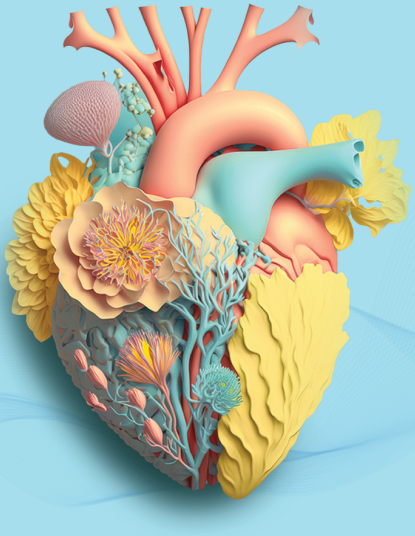

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