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A Knowledge Sharing Initiative by Medanta

Dr. Naresh Trehan honoured with 'Seven Legends' award by International Congress of Cardiac Surgery

Dr. Naresh Trehan. Chairman of the Board of Directors at Global Health Ltd., has been given the honorary distinction of being "Seven Wise Coronary Surgeons of the Golden Era of the 90's" by the International Congress of Cardiac Surgery. This Congress is a global society, which organizes and centralises various surgical centers focusing on patient outcomes, techniques, and progressive development of heart surgery. Dr. Trehan's inclusion among the "Seven Legends" acknowledges his significant role in pioneering contributions to advancing cardiac surgery. The award ceremony took place in Athens at the Old Parliament of Greece, with other internationally acclaimed doctors from across the globe in attendance.

Padma Bhushan and Padma Shri awardee Dr. Naresh Trehan said, "This recognition from the International Congress of Cardiac Surgery is a profound honor. I am grateful to my doctors and my staff at all the hospitals for their unwavering support and guidance, which have been instrumental in this accomplishment. We will continue to collaborate seamlessly and arrive at



the best possible treatment, customized for each patient, in line with our aim - quality healthcare for all. In addition to this, we will nurture the next generation of cardiac surgeons, ensuring this legacy of excellence continues to enhance countless lives through Medanta's medical acclaim."

Medanta@Work

A Rare Case of THES-2 **Diagnosed in Infant Boy**

Introduction

Trichohepatoenteric Syndrome is a very rare disorder. It was first described by Stankler in 1982 as Syndromic Diarrhoea with intractable diarrhoea, dysmorphic features, and hair abnormalities. Subsequently, more cases were reported with additional evidence of immunodeficiency and neonatal hemochromatosis. With this, Syndromic Diarrhoea was eventually renamed to Tricho-hepato-enteric syndrome or THES. There are two types of THES -type 1 and 2 based on type

of genetic mutations. Phenotypic variation between the two types is difficult to describe as the number of cases has been limited. According to Bard M. Al-Saleem et al., the total number of THES cases in the world is 58.

We present the case of an infant who has been diagnosed with THES. This could be the 59th known case of THES in the world...

Case Study

A 13-month-old boy was presented to us with chronic diarrhoea since birth, occurring 4-5 times a day. He also had anaemia for the past six months, requiring blood transfusion, which was done once. The mother reported abdominal distension and poor weight gain.

The stool was semisolid to watery, yellow-green in colour sometimes accompanied by excessive crying.

Although the child showed some improvement with antibiotics, probiotics and a low-lactose diet recommended by another doctor outside the hospital, the loose stools persisted with the same frequency. The patient had no history of blood in the stool, no family history of recurrent diarrhoea, or any concerning medical history in siblings or parents.

On examination at Medanta, his weight was between the 3rd and 15th percentile for age, while his height was between the 50th and 85th percentile according to the WHO chart.

At the time of presentation, the child was active, comfortably sitting in his mother's lap. His general condition was normal, except for his hair which was brown, slightly spars and brittle. He had pallor, no lymphadenopathy, cyanosis, icterus, gum hypertrophy or gum bleeding. His knuckle pigmentation was normal. His chest, cardiovascular and central nervous system examinations were normal. No organomegaly was seen on abdominal examination. There was no perianal excoriation or rashes either.

The child's primary source of nutrition was milk, and complementary feeding had not been adequately started because he was not tolerating the introduction of new foods well.

Based on the chronic diarrhoea, potential malabsorption, and anaemia, a differential diagnosis of celiac disease, cow's milk protein allergy, lactose intolerance, pancreatic insufficiency, and very early onset inflammatory bowel disease was considered.

A comprehensive laboratory workup was performed to investigate the cause of the patient's symptoms.

Complete Blood Count (CBC) workup showed within-range haemoglobin at 10.4 g/dL; elevated White Blood Cell Count (WBC) at 11700 mm3 with differentials (Neutrophils 47%, Lymphocytes 43%, Eosinophils 5%); mean corpuscular volume (MCV) of 75 fL; low mean corpuscular hemoglobin (MCH) 22.1 pg; and low mean corpuscular haemoglobin concentration (MCHC) at 29.3 g/dL.

Inflammation markers—C-reactive protein (CRP) and procalcitonin were at 0.8mg/dL and 0.07lng/mL, respectively.

Liver function tests were largely within normal range—total bilirubin 0.22 mg/dL, 2.82 g/dL globulin, alanine aminotransferase (ALT) 33 U/L, aspartate aminotransferase (AST) 58 U/L, alkaline phosphatase (ALP) 220 U/L—while albumin at 4.4 g/dL was within normal range.

25-hydroxyvitamin D3 was slightly on the lower side at 47.8 ng/mL. Other tests including thyroid function tests,



The child's hair was brown, slightly spars and brittle. He had pallor, no lymphadenopathy, cyanosis, icterus, gum hypertrophy or gum bleeding.

electrolytes, and stool analysis for ova/parasites were largely normal—thyroid stimulating hormone (TSH) 2.071mIU/L; FT4 1.11ng/dL; FT3 4.45 pg/mL); sodium 137 mmol/L; potassium 4.84 mmol/L; fecal calprotectin <50 µg/g; fecal elastase 38.50 µg/g stool which was below normal range suggestive of malabsorption.

Kidney function tests—serum creatinine (0.23 mg/dL) and blood urea nitrogen (BUN) (8 mg/dL) with normal serum calcium level(10.2 mg/dl).

His immunology test findings indicated against Celiac Disease: Total IgA was 85.56 mg/dL in a 70-400 range; anti-TTG IgA was 0.4 AU/mL and endomysial antibody was 1:10.

His cholesterol profile finds were also insignificant: Total Cholesterol 156mg/dl; Triglyceride 163 mg/dl; HDL 43mg/dl and LDL 85.02mg/dl.

Stool reducing substances test and a pH test were done outside, and were within the normal range.

Despite negative tests for common causes of malabsorption, the persistent diarrhoea and microcytic anaemia suggested further investigation. Recurrent diarrhoea with brown hypo-pigmented and brittle hair with negative anti-TTG, EMA and absence of reducing sugar strongly indicated Syndromic Diarrhoea. So, the patient was planned for genetic testing.

Whole exome sequencing revealed a mutation in SKIV2L gene confirming Trichohepatoenteric Syndrome-2 (THES2), Autosomal Recessive.

Discussion

THES is a multisystem disorder incorporated in congenital diarrheal diseases known as enterocyte epithelial alteration disorders, such as tufting enteropathy and microvillus inclusion disease. THES is classified into type 1 (TTC37-related) and type 2 (SKIV2L-related).



THES2 is an autosomal recessive disease and is characterized by intractable chronic diarrhoea starting from birth. Almost 90% of children with this condition have abnormal woolly hair that are difficult to comb and brittle. Some also present with intrauterine growth restriction (IUGR), facial dysmorphism, and short stature.

The prognosis is guarded. Due to recurrent diarrhoea, these children fail to thrive, not gaining weight or height. They are prone to infections, and develop liver cirrhosis as they age.

The usual management of THES2 is total parentral nutrition. But our patient was not put on parentral feeds due to variation in phenotype, and possibility of complications that may develop at a later stage.

The child is gaining weight and height with no sign of failure to thrive. Since his biochemical markers, including total protein and lipid profile are normal, he is being given multivitamin supplements. He is on regular OPD follow-up. He is currently evaluated on a monthly basis and provided with micronutrient supplements.

He continues to have diarrhoea 2 to 3 times a day with a developmental assessment showing that the child is accomplishing all cognitive and physical milestones in time.

Conclusion

This case highlights the importance of considering rare diagnoses in infants with chronic presentations (chronic diarrhoea, malnutrition) defying common explanations. A high index of suspicion for THES prompted genetic testing, which definitively diagnosed THES-2 caused by a mutation in the SKIV2L gene.

Early diagnosis of THES-2 allowed for targeted management, including micronutrient supplementation. While the patient continues to experience chronic diarrhoea, he is demonstrating catch-up growth and normal development, suggesting a potentially favourable course despite the guarded prognosis typically associated with THES-2.

Further studies are needed to understand the longterm effects of early diagnosis and intervention on the clinical course of THES-2. This case contributes to the growing body of knowledge about this rare syndrome.

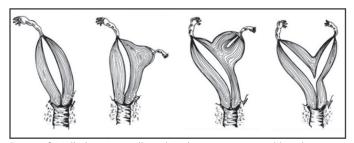
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Complex Mullerian Anomaly in 15-year-old Teen Managed with Laparoscopic Surgery

Mullerian structures are the structures present in female foetus that eventually develop into a woman's reproductive organs. Mullerian disorders are congenital disorders occurring during foetal development and are present at birth. They may affect up to 4% of females. There are many causes of such anomalies. While some are hereditary, others are due to random genetic mutations or developmental disorders.



Types of Mullerian Anomalies: a) Unicornuate uterus; b) Unicornuate uterus with rudimentary horn; c) Unicornuate uterus with cavitary non-communicating horn; this was the kind of anomaly seen in our patient d) Unicornuate uterus with communicating cavitary horn.

Embryology

In the female foetus, two Mullerian ducts are formed, which fuse to form the uterus, the two fallopian tubes and upper two thirds of the vagina. The ovaries and lower one-third of the vagina have a different origin. After fusion, the intervening septum disappears to form normal organs. Normal development of these organs requires organogenesis, fusion and septal resorption. Arrest or improper development at any of these stages results in Mullerian anomalies.

Renal anomalies are present in about 29% of Mullerian duct anomalies. They are more common with unicornuate uterus, being present in about 40% of women with this condition; 67% of renal anomalies are agenesis, and are ipsilateral to the rudimentary horn. Other anomalies may be horseshoe kidney, ectopic kidney or duplicated collecting system.

We present a case of unicornuate uterus with cavitary non-communicating rudimentary horn associated with ipsilateral renal agenesis in a 15-year-old girl.

Case Study

A 15-year-old hearing and speech impaired girl presented to us with pain in the lower abdomen not relieved with medicines. Her elder sibling was also

similarly hearing and speech impaired. She did not have any urinary and bowel complaints. She had good IQ and normal comprehension. On examination, there was a vertical scar on the abdomen; no lump was felt.

She was operated at another centre after she first reported abdominal pain—five months before the time of presentation at Medanta. A laparotomy, with drainage of pus from the abdomen and vaginoplasty with repair of anorectal injury, was done. Subsequently, a month after the surgery, she menstruated. However, no periods happened thereafter and the abdominal pain progressively worsened.

Upon visiting our OPD, investigations and imaging were done. Her MRI showed two uterine horns—the left-sided horn was functional and communicating with the vagina, but distal vagina showed atresia; the right horn was functional and non-communicating. There was haematometrocolpos with distal vaginal atresia. Right kidney was not visualized anywhere; left kidney, ureter and urinary bladder were normal.

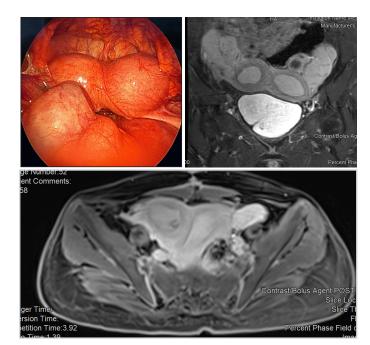
After counselling the family, the girl was examined under anaesthesia and vaginoplasty, hysteroscopy and laparoscopic removal of right rudimentary uterine horn and adhesiolysis were done. There was a vaginal dimple about 5mm deep with rectal and vaginal walls adherent over the area.

On doing the laparoscopy, we saw two equal-sized distended uterine horns with both fallopian tubes dilated and tortuous. Right ovary was adherent on the right pelvic wall, left ovary had a 3cmx4cm endometriotic cyst. There were endometriotic deposits on the walls of the uterus and the pelvis.

Right uterine horn and tube were removed laparoscopically. The vagina was found atretic over 5mm length at the junction of upper two-third and lower one-third. A patent vagina was created by dissecting and separating the rectal and vaginal walls, excising the atretic area, and suturing the proximal and distal margins.

After creating a vagina, hematometra was drained and a hysteroscopy was done, left ostium was seen with normal endometrium. The right ostium was not seen, confirming the diagnosis of non-communicating right horn. A vaginal mould—created with a Ryle's tube on a condom—was inserted to prevent restenosis of vagina.

After the surgery, her stay and recovery was uneventful. Intravenous antibiotics and pain killers were given, and she was discharged on Day 4. To aid healing, periods were suppressed for 12 weeks by giving leuprolide acetate injections. During the Week 1 OPD follow-up, the vaginal mould was changed. The girl and her mother were taught to clean and insert a dilator every day. At an eight-week follow up, a vaginoscopy showed that the vagina was completely epithelized.



(Clockwise from top) Intraop image of uterus with two equal-size distended horns; MRI images showing unicornuate uterus with functional non-communicating right horn

Eight weeks after the surgery, our patient is doing well and is on a three-monthly follow-up.

Discussion

The difficulties and dilemmas while managing such young girls are expected due to the complicated surgery as well as the psychosocial and emotional factors associated with Mullerian disorders.

The girl had been previously operated at another hospital, and the stenosis of the vagina occurred after this surgery. Dense adhesions between the vaginal and rectal walls had to be negotiated to create a patent vagina without causing further injury to the organ.

In the post operative period, and later till matrimony, it is of utmost importance to keep the vagina patent by daily self-insertion of vaginal dilators to ensure continuity of periods. This may be difficult in such young patients due to incomplete understanding of the problem, associated taboos and apprehension.

In our case, we counselled the family thoroughly and convinced them to remain in close follow up.

The readiness for a surgery of this magnitude must be assessed in this situation. The emotional needs, psychological counselling and support system for the patient must be strengthened. Future concerns regarding fertility, ability to carry children and having a normal pain-free life must be assessed.

Normal pregnancy and childbirth have been reported in such cases. However, the incidence of subfertility,

increased chances of abortion and preterm birth and greater chances of having a caesarean section have been seen. Good antenatal care and regular checkups are needed to optimize the outcomes.

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Spotlight

Navigating a Rare Diagnosis: AL Cardiac Amyloidosis in a Patient with Anasarca

Amyloidosis is a generic term that refers to the extracellular tissue deposition of fibrils composed of subunits of a variety of normal serum proteins. These fibrils have a predominantly antiparallel beta-pleated sheet configuration (noted on x-ray diffraction), and can be identified on biopsy specimens both by their characteristic appearance on electron microscopy and by their ability to bind Congo red, leading to green birefringence under polarized light.

The four most common forms of systemic amyloidosis are: Immunoglobulin light chain (AL) amyloidosis, wild type transthyretin amyloidosis (ATTRwt), hereditary (familial) amyloidoses (ATTRv) and AA amyloidosis.

AL amyloidosis is a systemic disorder that can present with a variety of symptoms, including heavy proteinuria that is usually in the nephrotic range, edema, hepatosplenomegaly, otherwise unexplained heart failure, and carpal tunnel syndrome. Although virtually all patients have multisystem amyloid deposition, it is not uncommon to present with evidence of mainly

one organ being affected. We present the case of a young woman who presented with anasarca and her subsequent evaluation and treatment.

Case Study

A 38-year-old woman presented with complaints of generalised swelling of her entire body since the last three to four months. It was insidious in onset, gradually worsening in nature. She did not have any associated symptoms along with this. There was no significant past medical or surgical history nor relevant family history or any underlying comorbid conditions. She was evaluated at an outside hospital by a nephrologist and was detected with sub-nephrotic range of proteinuria, for which she was managed conservatively and sent home. 2D Echocardiogram was done there which showed an Ejection fraction of 45%.

The following month, her symptoms recurred. Swelling was more predominant on her face than the lower limbs. She also had dyspnoea, which aggravated on exertion and she faced difficulty in climbing stairs. She did not give any history of chest pain, cough with expectoration or palpitations.

On examination, her BP was 130/70 mm of Hg, pulse rate was 88/min and regular, SpO2 was 98% in room air, pallor was present, pitting pedal oedema over both lower limbs, jugular venous pressure (JVP) was not elevated. Systemic examination revealed fine inspiratory crepitations over basal lung fields while other systemic examination was non-contributory.

She was admitted to Medanta under the Department of Nephrology for anasarca. Routine investigations showed iron deficiency anaemia, normal total leucocyte counts, normal renal and liver functions. Urine routine did not show proteinuria. TSH value was raised with Free T3 and Free T4 within range. Chest X-ray showed bilateral pleural effusion.

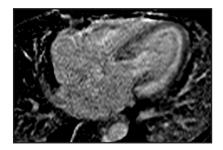
Despite having a fair ejection fraction and insignificant blood workup that could help establish the diagnosis of this case, the 2D Echo was repeated, which showed left ventricular hypertrophy (LVH) with a sparkling appearance. But, despite the hypertrophy, ECG did



2D Echo showing left ventricular hypertrophy (LVH) with a sparkling appearance. But, despite the hypertrophy, ECG did not show features of LVH.

not show features of LVH. Corroborating the 2D Echo findings with the ECG finding in this context, free light chain assay was sent showing markedly elevated lambda chain (421) and low kappa chain (34.5) with a K/L ratio of 0.08.

Serum protein electrophoresis was done which showed polyclonal expansion of gamma globulins and no M spike was seen. Serum immunofixation showed monoclonal faint band in lambda light chain only with no corresponding bands in IgG, IgA, or IgM heavy chains. Other investigations such as ANA by IFA, ENA profile and ANCA were negative. Serum ACE levels were within normal range. A cardiac MRI was



Cardiac MRI showing diffuse left ventricular wall thickening with Late Gadolinium Enhancment diffuse heterogenous increased signal uptake noted in the left ventricle.

done which showed features suggestive of cardiac amyloidosis. Bone marrow aspiration and biopsy was done for confirmation, which showed congophilic substance with apple green birefringence on polaroid microscopy. Abdominal fat pad biopsy was negative for amyloid deposit. Hence, we came to a final diagnosis of AL Cardiac Amyloidosis.

Chemotherapy was initiated by the Department of Medical and Haemato-Oncology with close monitoring of vital parameters and symptomatic status. The patient improved with the treatment given and was discharged. She is currently on OPD follow-up.

Discussion

Clinical suspicion interlinking our clinical findings with radiological investigations helped us clinch the diagnosis for prompt treatment. Although AL Cardiac Amyloidosis usually has a multi-system involvement, our patient did not show any other systemic involvement.

AL Amyloidosis is an uncommon disorder and the exact incidence is unknown. It can also occur in patients with other plasma cell dyscrasias, including multiple myeloma and Waldenström's Macroglobulinemia, which are malignant disorders of plasma cells or lymphoplasmacytic cells, respectively. If AL amyloidosis is still suspected in the setting of negative fat pad aspiration and bone marrow biopsy, then the affected organ, which could be the heart, kidney or liver, should be biopsied. Given the common occurrence of monoclonal gammopathy of undetermined significance (MGUS) in the general population, especially in older adults, the presence of a monoclonal protein in conjunction with





(Left) Bone marrow biopsy showing amorphous acellular congophilic material in 2 interstitial blood vessels. (Right) Apple green birefringence as seen on polarizing microscopy.

the demonstration of amyloid deposition may not always indicate that the amyloidosis is of the AL type. Close differentials include other types of amyloidosis (AA, ATTRwt etc.), MGUS or Smouldering Myeloma.

In patients with AL Cardiac Amyloidosis and reduced systolic function, the goal of pharmacologic therapy is to relieve HF symptoms and avoid adverse drug effects. Treatment consists of general measures used to treat HF (salt and water restriction) and use of a diuretic for volume management. Patients with AL cardiac amyloidosis who have refractory HF symptoms should be offered palliative care and be evaluated for the feasibility of continuous inotropic support, heart transplantation, and mechanical circulatory support.

Conclusion

As clinicians, we should be aware of the wide variety of presentations and aetiologies associated with heart failure. Patients with AL cardiac amyloidosis needs careful watch for and the management of expected cardiac complications. Due to the latest advancements in medicine and the availability of newer molecules, cardiac amyloidosis is now a treatable and reversible cause of cardiomyopathy. The earlier the detection, the faster the initiation of treatment and thereby can result in better outcomes for the patients.

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Kudos



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Welcome Onboard



Dr. Dharmendra Singh Bhadauria

Director - Nephrology and Kidney Transplant Medicine Medanta - Lucknow

Kidney transplant expert with 17 years of experience, Dr. Bhadauria specialises in dialysis therapy, management of all renal diseases, especially glomerulonephritis. An editor for international and Indian journals on transplantation, he has more than 200 research publications and book chapters to his credit.





Dr. Nitin Kumar RajputAssociate Dirctor - Cardiac Surgery

Medanta - Gurugram

Renownedforhisexpertise in cardiovascular surgery, Dr Rajput specialises in robotassisted and minimally invasive cardiac surgery (adults), beating heart surgery, surgery for cardiac tumours, redo coronary artery bypass, coronary artery bypass, endoscopic valve replacement (mitral and aortic), redo valve replacements.





Dr. Shweta Rai

Associate Director - Gynaeoncology Medanta - Patna

Expert in cytoreductive surgery, with or without HIPEC, Dr. Rai specialises in minimally invasive surgery. She has keen interest in fertility-preserving surgery in eligible cancer patients, preventive gynaecology, cervical cancer screening, and public health.





Dr. Upali Nanda

Senior Consultant - Internal Medicine Medanta - Gurugram

Dr. Nanda brings with her a decade's experience in the management of diabetes, renal disorders, liver disorders and infectious diseases.





Dr. Jimmy Pathak Consultant - Endocrinology & Diabetes Medanta - Gurugram

Skilled in the management of diabetes mellitus, including type 1, 2, gestational and others, she is an expert in handling thyroid disorders, calcium and metabolic bone disorders, and disorders of the adrenals, pituitary gland and growth and puberty disorders.



Medanta - Lucknow Dr. Kaushal has a proven track record for excellence in diagnosing, treating,

and managing a wide range of medical

Dr. Harsh Kaushal

Associate Consultant - Internal Medicine





Dr. Tej Kumar Varma K Consultant - Cardiac Surgery Medanta - Gurugram

Expert in minimally invasive adult cardiac surgery (CABG, MVR, ASD Closure, MVR), coronary artery bypass graft surgeries, heart valve surgeries, thoracic surgery, vascular procedures, Dr. Varma brings over a decade of experience with his practice.



Dr. Sumit Alok Associate Consultant - Critical Care Medanta - Patna

Expert in general anaesthesia with fiberoptic intubation, USG-guided blocks for surgical anaesthesia, post-operative pain and critical care management. His skills extends to monitored anaesthesia care (MAC), and ICU procedures





Dr. Anshu Kumari Associate Consultant - Anaesthesia Medanta - Patna

Specialises in paediatric anaesthesia, neuro anaesthesia, transplant anaesthesia, difficult syndromic airway, fiberoptic intubation, critical care management, post-operative pain management, USGguided regional blocks



A people-first newsletter

This month, we bring tips to help kids fight off infections, reasons why cancer screening is the best gift you can give yourself, and tips for men and women to age well.



conditions.

For **EMERGENCY** DIAL 1068

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