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Bilateral Hydrouteronephrosis Dilated Vur with Cystitis: A Case Study

Akash Dighade [a*#], Suhas Tivaskar [b≡], Anurag Luharia [c≡] and Ravi Christian [d]

[a] School of Allied Health Sciences, Datta Meghe Institute of Medical Sciences, Wardha, Maharashtra, India.
[b] Department of Radiology, MRIT (Medical Radiology and Imaging Technology), School of Allied Health Sciences, Jawaharlal Nehru Medical College, Datta Meghe Institute of Medical Sciences, Wardha, Maharashtra, India.
[c] Department Radiology, School of Allied Health Sciences, Jawaharlal Nehru Medical College, Datta Meghe Institute of Medical Sciences, Wardha, Maharashtra, India.
[d] MRIT, School of Allied Health Sciences, Datta Meghe Institute of Medical Sciences, Wardha, Maharashtra, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Background: Hydroureteronephrosis is a blockage to free flow of urine from the kidney causes hydroureteronephrosis, which causes dilation of the renal pelvis, calyces, and ureter, resulting in gradual atrophy of the renal cortex. "Dilation of the ureter due to obstruction of urine outflow is called hydroureter". Hydronephrosis produces a dull pain and discomfort in the lower abdomen due to increasing bladder distension. A continuous obstruction in the flow of urine can lead to high blood pressure, sepsis, urinary tract infection, hematuria, and renal failure.
Clinical Findings: Difficulty in passing urine since 2-3month, in situations of benign prostate enlargement, urinary frequency, a weak urine stream, and a sense of incomplete emptying, lack of appetite and fever (Temperature - 101˚F).
Diagnostic Assessment: Blood test: Hb – 9.1 gm%, Total RBC count – 5.04millions/cumm, RDW – 17.8%, HCT – 31.9%, Total WBC count – 11600/cumm, Monocytes – 04%, Granulocytes – 30%,

[#] B.Sc. MRIT Intern;
[≡] Assistant Professor;
**Corresponding author*

Lymphocytes – 64%, AST(SGOT) – 45U/L. Peripheral Smear: RBCs – predominantly microcytic mildly hypochromic with mild anis poikilocytosis showing few pencil cells. Platelets – adequate on smear. No hemiparasite seen.
Ultrasonography: The right kidney measure is 5 x1.9cm and left is 5.6 x2.6cm shows mild dilation of pelvic-calyceal system. Left kidney shows mild hydronephrosis with renal pelvic diameter 1.06cm hydroureters seen up to left vesico-urethric junction. Bilateral uterus dilated up to lower end to UVR. Uterus bladder is thickened wall and distended Mild cystitis dilation of B/L dilated uterus and hydronephrosis with UVR.
Therapeutic Intervention: Syp Cefixime 2.5ml x BD, Syp. MVBC 5ml x BD, Syp. Calcimax 5ml x BD, Syp. Orofer 5ml x OD, Syp. Nitrofurantoin 2.5ml x BD, Inj. Metro 100mg x TDS, Inj. Pantop 40mg x OD, Inj. Ceftriaxone 500mg IV x B and IVF DNS with Inj. KCL stat.
Outcome: After treatment, the child show improvement. No complaint of fever, pain, and difficulty in urine pass and urine frequency .
Conclusion: The patient was hospitalized to AVBRH's Pediatric Ward No. 14 with Bilateral hydrouteronephrosis dilated VUR with cystitis. Her health begins to improve when he received proper therapy.

Keywords: Cystitis; hydronephrosis; hydroureter; pelvic-calyceal system; vesicoureteral reflux.

1. INTRODUCTION

Hydroureter and hydronephrosis are frequent conditions seen in routine care, emergency medicine, and nephrology and urology [1]. Hydroureteronephrosis is blockage to free flow of urine from the kidney causes hydroureteronephrosis, which causes dilation of the renal pelvis, calyces, and ureter, resulting in gradual atrophy of the renal cortex [2]. Dilation of the ureter due to obstruction of urine outflow is called hydroureter [1].

Each year, around 6% of all births globally (8 million children) and United States (almost 120,000 newborns) in 3 percent live birth are affected by a severe hereditary birth defect. Hydronephrosis is becoming more prevalent in newborns and babies, with the most common cause being blockage of the ureteropelvic junction [3-4].

Congenital renal and urinary tract disorders affect 1 percent of human babies (CAKUT). CAKUT is a term that refers to a group of congenital diseases that include kidney abnormalities including hydronephrosis and renal hypoplasia, as well as LUT abnormalities including vesicoureteral reflux (VUR), urinary tract obstruction, bladder, and urethral abnormalities [5-6].

The urinary system is a comprehensive system that generates, delivers, collects, and eliminates urine in order to keep, physiological homoeostasis by regulating the fluid and electrolyte balancing. The kidneys act as a filter and changes in bloodstream to produce urine, while the ureter, bladder, and urethra transport, collect, remove bodily fluids into outside, and are anatomically responsible for these activities [7-8].

Anatomically, it includes the renal, ureters, urinary bladder, and urethral. A cortex and medulla exist in each kidney, forming renal pyramids and reach into the glomerulus, where the ureter continues. Hydronephrosis and hydroureter may occur separately or in combination. They can affect people of various ages. The symptoms might be transient or persistent, physiologic (particularly frequent in expectant mothers) or pathogenic, unilateral or bilateral, and can be unilaterally or bilaterally [1].

The ureter's main function is to carry urine from the kidneys to the urinary bladder in a single route. As a result, ureteral abnormalities its related to junction structures (i.e. UPJ and UVJ) are frequently associated with improper urine carry, such as urinary blockage and vesicoureteral reflux (VUR: urine flowing backwards from the bladder to the ureter and kidney). Both VUR and renal blockage elevate strain in the ureter and kidney arch, and the two conditions can exist in the same person. 8 With a frequency of more than 1%, urinary obstruction and medical experts consider VUR as one of the most prevalent illnesses they see [9-10].

Person who acquires obstructive or reflux nephropathies as a result of obstruction in the urinary and VUR at an early age may have repeated infections, renal scar, nephron atrophy, compensating enlargement compensatory

hypertrophy of residual nephrons [11]. VUR causes dilated renal pelvis and dilated ureter. It promotes the colonization and development of bacteria like E. coli in the urine and predisposition CALUT individuals to recurring Infections [12].

Hydronephrosis produces a dull pain and irritation in the abdominal area due to increasing bladder distension. A continuous obstruction in the flow of urine due to high blood pressure, sepsis, urinary tract infection, hematuria, and renal failure [13]. Pregnancy, parapelvic tumors, retrocaval ureter, cancer, trauma, perinephric scarring, and prostatic abscess are all examples of extrinsic compression [1].

The treatment approach for babies with prenatal hydronephrosis is determined by the duration of postnatal hydronephrosis, symmetrical participation, and intensity of the hydronephrosis. Blockage distal to the urine bladder causes bilateral hydronephrosis. Bilateral hydroureteronephrosis is most commonly caused by the posterior urethral valves. For a more specific diagnosis, a voiding cystourethrogram should be done[14]. Prenatal hydronephrosis have rhe risk of pyelonephritis in children, with a greater link in girls [15]. No any evidence that ongoing antibiotic to prevent UTIs benefits babies with severe hydronephrosis [16].

If a urinary obstruction at the bladder level is diagnosed, a urinary catheter should be inserted. The placement of a ureteral stent guided by cystoscopy is a common therapy for ureteral hydronephrosis caused by both intrinsic and extrinsic factors. Interventional radiologists can utilize fluoroscopy to guide the insertion of a percutaneous nephrostomy tube when ureteral stents is inappropriate or impossible to implant[1].

Endovascular shock lithotripsy is used to remove stones in the ureter to prevent future hydronephrosis and obstruction. External strain from aneurysms in the pelvis, peritoneum, and aorta, among many other things, needs surgery in some cases. The most prevalent side effect of hydronephrosis is a urinary tract infection. It can also cause pyelonephritis, a kidney infection. Patients may experience post-obstructive diuresis when a persistent blockage is removed [1].

Patient Identification: A female child of 3 years from Chandrapur admitted to pediatric ward, AVBRH on 25th August 2021with a known case of bilateral hydrouteronephrosis dilated VUR with cystitis. She is 10kg weight and her height is 92 cm.

Present medical history: A female child of 03 years old was brought to AVBRH on 25th August 2021 by her parents with a complaint of difficulty in passing urine since 2-3month, in situations of benign prostate enlargement, urinary frequency, a weak urine stream, and a sense of incomplete emptying, lack of appetite and fever. She was admitted to Pediatric ward no. 14 she is a known case of bilateral hydrouteronephrosis dilated Vesicoureteral Reflux (VUR) with cystitis and her Hemoglobin level at the time of admission was 9.1 gm%. The child is weak and inactive on admission.

Past medical history: The past medical history of my patient she has difficulty in passing urine since 2-3month, urinary frequency, Pain, fever. Her ongoing general treatment in private hospital in Chandrapur. She was admitted to hospital due to increase swelling and fever. Till then, she was undergone on treatment in AVBRH Sawangi (M) Wardha.

Present surgical history: No any present surgery is planned.

Family history: There are three members in the family. My patient was diagnosed to have Bilateral hydrouteronephrosis dilated VUR with cystitis. All other members of the family were not having complaints in their health except for my patient who was being admitted in the hospital.

Past intervention and outcome: As the patient she has some problems such as Difficulty in passing urine since 2-3month, urinary frequency, Pain, fever etc. from that time onwards she was ongoing general treatment in hospital time to time. It was found, the problem was worse and the patient does develop complications till then.

Clinical findings: Difficulty in passing urine since 2-3month, in situations of benign prostate enlargement, urinary frequency, a weak urine stream, and a sense of incomplete emptying, lack of appetite and fever (Temperature - 101˚F).

Etiology: Two forms of compression that cause urinary obstruction are intrinsic and extrinsic compression. Intrinsic blockage can be caused by a variety of factors, including Calculi, cancer, ureteropelvic junction stenosis, ureteral strictures

from previous inflammation, kidney cysts, posterior urethral valves, prostate gland, and neuropathic bladder. Pregnancy, pelvic cysts, retrocaval ureter, neoplasia, injury, peritoneal fibrosis, and prostatic abscess are only a few of the causes of extrinsic compression. Anatomical defects comprise the majority of occurrences in valves of children urethral strictures, as well as ureterovesical or ureteropelvic junction stenosis, are examples [1].

Physical examination: There is not much abnormality found in head-to-toe examination, the child is lean and thin and having dull look. She is weak and not so cooperative. Though it is found that the child is having swelling on right-side of gluteal region.

Diagnostic assessment: Blood test: Hb – 9gm%, Total RBC count – 5.04millions/cumm, RDW – 17.8%, HCT – 31.9%, Total WBC count – 11600/cumm, Monocytes – 04%, Granulocytes – 30%, Lymphocytes – 64%, AST(SGOT) – 45U/L. Peripheral Smear: RBCs – predominantly microcytic mildly hypochromic with mild anis poikilocytosis showing few pencil cells. Platelets – adequate on smear. No hemiparasite seen.

Ultrasonography: The right kidney measure is 5 x1.9cm and left is 5.6 x2.6cm shows mild dilation of pelvic-calyceal system. Left kidney shows mild hydronephrosis with renal pelvic diameter 1.06cm hydroureters seen up to left vesico-urethric junction. Bilateral uterus dilated up to lower end to UVR. Uterus bladder is thickened wall and distended S/o cystitis Mild cystitis dilation of B/L dilated uterus and hydronephrosis with UVR.

Therapeutic Intervention: Syp Cefixime 2.5 ml x BD, Syp. MVBC 5ml x BD, Syp. Calcimax 5 ml x BD, Syp Orofer 5ml x OD, Syp. Nitrofurantoin 2.5 ml x BD, Inj. Metro 100 mg x TDS, Inj. Pantop 40 mg x OD, Inj. Ceftriaxone 500 mg IV x B and IVF DNS with Inj. KCL stat.

2. DISCUSSION

A female child 3yrs old admitted in AVBRH on 25th August 2021 in pediatric ward no 14 with chief complaint of difficulty in passing urine Since 2-3month In situations of benign prostate enlargement, urinary frequency, a weak urine stream, and a sense of incomplete emptying, lack of appetite and fever. As soon as she was admitted to hospital investigations were done and appropriate treatment were started. After getting treatment, she shows great improvement and the treatment was still going on till my last date of care.

Rasouly HM, Lu W.- According to Machie and Stephens' "bud theory," When renal branches grow at inappropriate Wolffian duct locations, like numerous renal branches), the final placements of the urethral stricture apertures could also be erroneous, leading to faulty ureterovesical connectors, VUR, or UVJ blockage. According to recent cell lineage research, the nephric duct dies rather than growing into the trigone. As a result, mutations in genes controlling early ureteric buds' development and placement throughout fetal life and after delivery frequently cause renal abnormalities including renal blockage, VUR, and hydronephrosis in both people and mice [17].

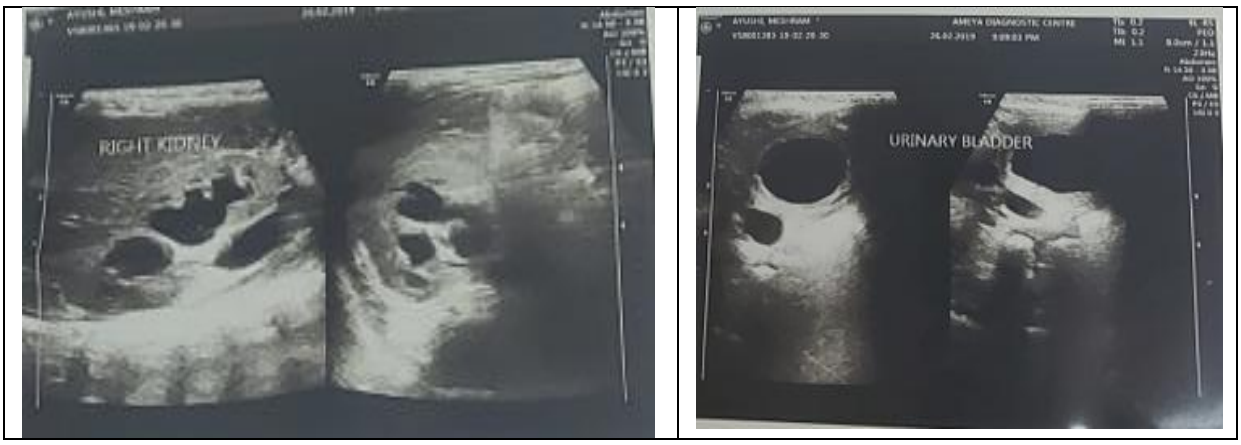

Fig. 1. USG images of Right Kidney and Urinary bladder

Lee RS, - We sifted through 1645 references and found 17 articles that fit our criteria. A total of 1308 individuals were polled for the data. For mild, 45.1 percent for moderate, and 88.3 percent for severe prenatal hydronephrosis, the chances of any postpartum disease were 11.9 percent, 45.1 percent, and 88.3 percent, respectively. With greater degrees of hydronephrosis, there was a substantial increase in the risk. For all degrees of prenatal hydronephrosis, the incidence of vesicoureteral reflux was the same. The findings of this meta-analysis might be utilized for prenatal counselling and could have an impact on how children with antenatal hydronephrosis are treated after delivery. Children with prenatal hydronephrosis are more likely than the general population to develop postnatal pathology. Intensive postnatal diagnostic treatment is required. Mild prenatal hydronephrosis may increase the chance of postpartum illness, but more research is required to figure out the best therapy for these kids. A well-defined prospective study is required to better describe the danger of disease and the appropriate treatment methods [18].

Heikkilä J, Rintala R, Taskinen S **-** There were 73 patients with bilateral vesicoureteral reflux (37%), and 54 with unilateral reflux (27 percent). When reflux was detected, 99 cases of posterior urethral valves were discovered after birth (p0.001). When compared to individuals who did not have reflux, people with reflux had significantly higher blood creatinine levels at presentation, 6 months after surgery, and 12 months following surgery (especially bilateral reflux). The divided functions of refluxing kidneys were revealed to be severely reduced in unilateral instances. After treatment of the posterior urethral valves, reflux disappeared spontaneously after 1.28 years (range 0.04 to 15.16), with individuals with unilateral illness resolving more quickly. Vesicoureteral reflux is generally associated with decreased kidney function in people with posterior urethral valves. Patients' total renal function deteriorates as a result of bilateral reflux. Due to valve ablation, reflux in 50% of the ureters has gone after two years. In unilateral conditions, reflux clears up quickly[19,20].˙ Studies addressing related renal conditions were reviewed [21-28].

3. CONCLUSION

Long-term tubular atrophy and interstitial fibrosis in the kidneys can be caused by hydronephrosis or hydroureter blockage. The duration and intensity of the blockage have an effect on the overall prognosis for renal recovery once it is removed [1]. Abnormalities of the lower urinary tract account for 20-30 percent of them prenatal malformations. Prenatal ultrasound screening during pregnancy enables for the early detection of a variety of lower urinary tract abnormalities in child (e.g., antenatal hydronephrosis) before urinary tract issues including infection, calculi and kidney inadequacy develop. These findings might have lengthy consequences for therapies targeted at decreasing the frequency of urinary tract infections and birth abnormalities, preventing additional kidneys harm inflicted by CALUT, and preserving residual renal function [20]. my patient shows great improvement after getting the treatment and the treatment was still going on till my last date of care.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Thotakura R, Anjum F. Hydronephrosis and hydroureter. StatPearls [Internet]; 2020.
2. Robbins SL, Cotran RS, Kumar V, Abbas AK, Fausto N, Aster JC. Robbins and cotran pathologic basis of disease. InRobbins and Cotran pathologic basis of disease. 2010;1450-1450).
3. Christianson A, Howson CP, Modell B. March of dimes: Global report on birth defects, the hidden toll of dying and disabled children. March of Dimes: Global report on birth defects, the hidden toll of dying and disabled children; 2005.
4. Yoon PW, Olney RS, Khoury MJ, Sappenfield WM, Chavez GF, Taylor D. Contribution of birth defects and genetic diseases to pediatric hospitalizations: a population-based study. Archives of

pediatrics & adolescent medicine. 1997; 151(11):1096-103.
5. Pope JC, BROCK JW, Adams MC, Stephens FD, Ichikawa I. How they begin and how they end: classic and new theories for the development and deterioration of congenital anomalies of the kidney and urinary tract, CAKUT. Journal of the American Society of Nephrology. 1999;10(9):2018-28.
6. Centers for Disease Control and Prevention (CDC. Hospital stays, hospital charges, and in-hospital deaths among infants with selected birth defects--United States, 2003. MMWR. Morbidity and mortality weekly report. 2007;56(2):25-9.
7. Costantini F, Kopan R. Patterning a complex organ: branching morphogenesis and nephron segmentation in kidney development. Developmental cell. 2010; 18(5):698-712.
8. Hildebrandt F. Genetic kidney diseases. The Lancet. 2010;375(9722):1287-95.
9. Sargent MA. Opinion: What is the normal prevalence of vesicoureteral reflux?. Pediatric radiology. 2000;30(9).
10. Peters CA, Skoog SJ, Arant BS, Copp HL, Elder JS, Hudson RG, Khoury AE, Lorenzo AJ, Pohl HG, Shapiro E, Snodgrass WT. Summary of the AUA guideline on management of primary vesicoureteral reflux in children. The Journal of urology. 2010;184(3):1134-44.
11. Bailey RR. The relationship of vesico-ureteric reflux to urinary tract infection and chronic pyelonephritis-reflux nephropathy. Clinical nephrology. 1973;1(3):132-41.
12. Quirino IG, Diniz JS, Bouzada MC, Pereira AK, Lopes TJ, Paixao GM, Barros NN, Figueiredo LC, Cabral AC, e Silva AC, Oliveira EA. Clinical course of 822 children with prenatally detected nephrouropathies. Clinical Journal of the American Society of Nephrology. 2012;7(3):444-51.
13. Iqbal S, Raiz I, Faiz I. Bilateral hydroureteronephrosis with a hypertrophied, trabeculated urinary bladder. The Malaysian journal of medical sciences: MJMS. 2017;24(2):106.
14. Mamì C, Paolata A, Palmara A, Marrone T, Berte LF, Marseglia L, Arena F, Manganaro R. Outcome and management of isolated moderate renal pelvis dilatation detected at postnatal screening. Pediatric Nephrology. 2009;24(10):2005-8.
15. Walsh TJ, Hsieh S, Grady R, Mueller BA. Antenatal hydronephrosis and the risk of pyelonephritis hospitalization during the first year of life. Urology. 2007;69(5):970-4.
16. Silay MS, Undre S, Nambiar AK, Dogan HS, Kocvara R, Nijman RJ, Stein R, Tekgul S, Radmayr C. Role of antibiotic prophylaxis in antenatal hydronephrosis: A systematic review from the European Association of Urology/European Society for Paediatric Urology Guidelines Panel. Journal of pediatric urology. 2017; 13(3):306-15.
17. Rasouly HM, Lu W. Lower urinary tract development and disease. Wiley Interdisciplinary Reviews: Systems Biology and Medicine. 2013;5(3):307-42.
18. Rhodes J, Curran TJ, Camil L, Rabideau N, Fulton DR, Gauthier NS, Gauvreau K, Jenkins KJ. Sustained effects of cardiac rehabilitation in children with serious congenital heart disease. Pediatrics. 2006;118(3):e586-93.
19. Heikkilä J, Rintala R, Taskinen S. Vesicoureteral reflux in conjunction with posterior urethral valves. The Journal of urology. 2009;182(4):1555-60.
20. Nguyen HT, Herndon CA, Cooper C, Gatti J, Kirsch A, Kokorowski P, Lee R, Perez-Brayfield M, Metcalfe P, Yerkes E, Cendron M. The Society for Fetal Urology consensus statement on the evaluation and management of antenatal hydronephrosis. Journal of pediatric urology. 2010;6(3):212-31.
21. Verma P, Talwar D, Phate N, Kumar S. Bradycardia, Renal failure, AV node blocker, Shock, Hyperkalemia (BRASH syndrome): Don't ignore it. MEDICAL SCIENCE. 2021;25(113):1513–6.
22. Wadekar, Abhijit, Yash Gupte, Parth Godhiwala, Swapnil Lahole, Sachin Agrawal, and Sunil Kumar. Emphysematous cystitis an unusual case of urinary tract infection in long standing rheumatoid arthritis: A case report. Medical Science. 2020;24(105):2993–96.
23. Patel, Mohan, Jitendra Goswami, Manish Balwani, and Manoj Gumber. Prediction of tacrolimus drug dosing and metabolism based on CYP3A5 polymorphism in Indian renal transplant recipients. Transplantation. 2018;102(7):S92. Available:https://doi.org/10.1097/01.tp.0000542683.60190.23
24. Andhale Amol, Sourya Acharya, Kanchan Devde, Yash Gupte, Sree Karthik Pratapa. Subdural haematoma (SDH) leading to subfalcine herniation in a case of end

stage renal disease. Journal of Evolution of Medical and Dental Sciences-JEMDS. 2020;9(39):2919–20. Available:https://doi.org/10.14260/jemds/2020/638

25. Bhagvat Aditya, Shilpa Abhay Gaidhane, Anusha Gupta, Nazli Khatib, Priti Abhay Karabdhajane. Scleroderma renal crisis presenting as posterior reversible encephalopathy syndrome. Journal of Evolution of Medical and Dental Sciences-JEMDS. 2020;9(52):4009–11. Available:https://doi.org/10.14260/jemds/2020/876
26. Lamture Yeshwant, Aditya Mehta. Splenic abscess with aortic thrombosis and right renal artery thrombosis. Journal of Clinical and Diagnostic Research. 2020;14(3). Available:https://doi.org/10.7860/JCDR/2020/42800.13548
27. Dhar R, Singh S, Talwar D, Mohan M, Tripathi SK, Swarnakar R, Trivedi S, Rajagopala S, D'Souza G, Padmanabhan A, Baburao A. Bronchiectasis in India: Results from the European multicentre bronchiectasis audit and research collaboration (EMBARC) and respiratory research network of India registry. The Lancet Global Health. 2019;7(9):e1269-79.
28. Nagrale AV, Herd CR, Ganvir S, Ramteke G. Cyriax physiotherapy versus phonophoresis with supervised exercise in subjects with lateral epicondylalgia: a randomized clinical trial. Journal of Manual & Manipulative Therapy. 2009;17(3): 171-8.

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