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Hydronephrosis Associated With Urinary Tract Infection



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ABSTRACT

Hydronephrosis occurs due to the urinary blockage which results in the swelling of renal calyces and ureter. Urine outflow distal to the renal pelvis. Similarly, Hydro ureter is the condition where there is a dilation of the ureter, and pyelonephritis is the inflammation of the kidney and renal pelvis that occurs due to the infection by the microbes mainly bacteria. This may lead to the severe stage called renal failure if untreated. Here I present a case of a 72-year-old female patient who was brought to the multispecialty hospital in Hyderabad with complaints of flank pain, dysuria and left joint pain. The patient was having a complicated Urinary Tract Infection (UTI). This condition can lead to renal failure if untreated or delayed recognition. Immediate recognition and appropriate medical care prevent succumbing. Here we present how a patient with the above complaints has been treated in the hospital comparing it with the actual management that should be followed as per the guidelines.

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1. Introduction

Hydronephrosis (Figure 1) is also known as acute infective tubulointerstitial nephritis [1]. Hydronephrosis can cause the damage of one kidney or both the kidneys (Figure 2) [2]. It is not an uncommon disease, happening in 1 of every 100 grown-ups sooner or later in their lives [3]. It averages happens in every now and next generation babies either before birth (pre-birth hydronephrosis) or after (postnatal) [4]. There are around 250,000 instances of intense pyelonephritis every year, bringing about over 100,000 hospitalizations. The most common etiological reason for this condition is the infection with *Escherichia coli* [5]. Urine culture with about 90% of the patients are diagnosed with pyelonephritis, and cultures have to be received before anti-biotic treatment is started. We can also use blood cultures instead of urine culture in the patients who are immunocompromised, and the individuals who are associated with having haematogenous contaminations [6].

2. Case Report

A 72-year-old female patient was admitted to the hospital on 01/11/2019 with complaints of flank pain, dysuria, and joint pain. She's a known case of Hypertension and Type-2 Diabetes mellitus. Her hospital stay lasted for 6 days and her vitals were normal but oxygen saturation SPO2 was fluctuating.

Haematology reports showed Decreased PCV levels and Lymphocyte count and there was significant Elevation in her ALP, Urea, Serum Creatinine levels along with decreased Na⁺ levels (126 mEq/L) as sug-

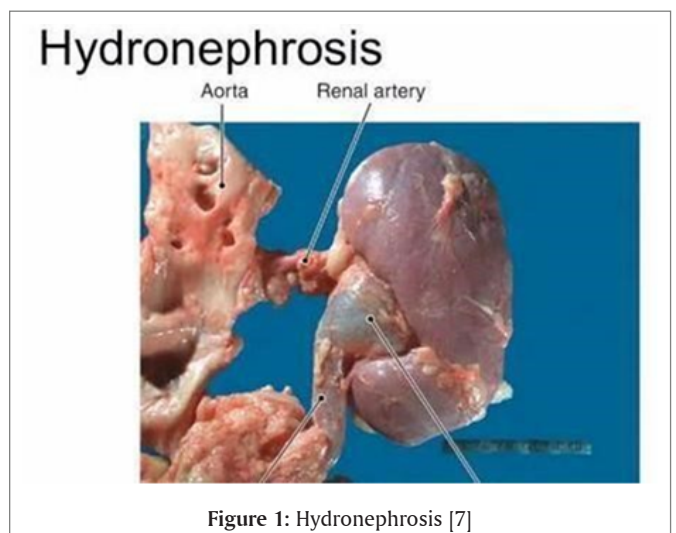


Figure 1: Hydronephrosis [7]

gested by the biochemistry reports. Liver function tests were done and showed Decreased Albumin/Globulin Ratio. The patient complained about Hematuria for which aPTT was advised on day-2 and the reports suggested an increase in aPTT and this might be Vitamin K deficiency. Ultra-sonography (US-KUB) report on day-4 reveals that the left kidney was bulky and the pelvicalyceal system was thickened. Coming to Microbiology reports culture showed the growth of *E. coli* colony with count 1 lakh CFU/ml).

Based on the subjective evidence, lab findings and CT report the pa-

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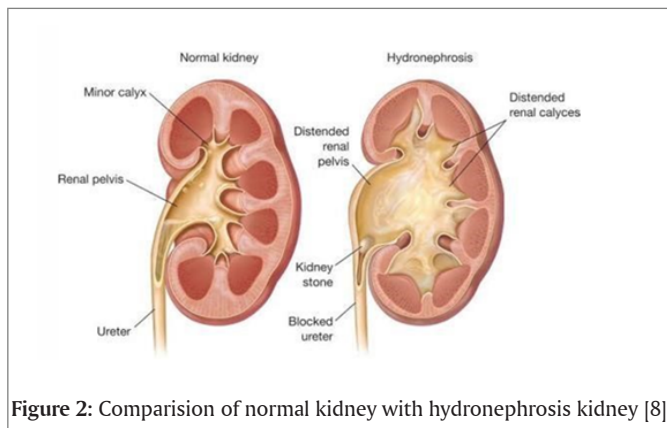


Figure 2: Comparison of normal kidney with hydronephrosis kidney [8]

Table 1: Medication Chart

S. No.	Medication		Dose	ROA	Freq.	Duration	
	Brand name	Generic name				Start Day	End Day
1	Inj. PAN	Pantoprazole	40 mg	IV	OD	D1	D6
2	Inj. Zofer	Ondansetron	4 mg	IV	BD	D1	D6
3	Inj. Monocef	Ceftriaxone	1 g	IV	BD	D1	D6
4	Inj. Insugen-N	Insulin	60 IU	SC	OD	D2	D6
5	Tab. Veltam	Tamsulosin	0.4 mg	PO	HS	D2	D6
6	Vit.K supplement	Vit.K	1 AMP	IV	OD	D2	D4
7	Tab. Resodim	Tolvaptan	15 mg	PO	OD	D3	D6
8	Syp. Duphalac	Lactulose	20 ml	PO	Stat	D3	D3
9	Tab. Dilzem-SR	Diltiazem	90 mg	PO	OD	D3	D4

tient was said to have pyelonephritis with moderate left hydronephrosis and Hydroureter with significant perinephric and periuretic fat standing and mucosal edema of the bladder at VUJ.

3. Discussion

The patient was admitted with complaints of dysuria and flank pain. It was found out to be a complicated UTI so to treat this condition Ceftriaxone was prescribed. To compensate side effects of it, Ondansetron and Pantoprazole were also prescribed along with it. The next day patient was gone through Foley’s catheterization to remove build-up of urine as it is the first stage in treating hydronephrosis, Vit-K supplement was given as her aPTT was prolonged. As catheterization was done Tamsulosin was given as it relaxes the smooth muscle in the bladder neck to improve urine flow. She is a known case of Type 2 Diabetes and Hypertension, Insulin and Diltiazem are given respectively. After observing the biochemistry report to improve the condition of hyponatremia Tolvaptan was prescribed. The next day she complained of constipation so Lactulose was given as stat dose. Table 1, It is a complicated UTI and US Food and Drug Administration (FDA) approved Meropenem-vaborbactam for adults and for complicated urinary tract diseases caused by Enterobacteriaceae: Escherichia coli. The safety and efficacy of Meropenem-Vaborbactam were exhibited in an investigation of more than 500 adults with complicated UTI, Including pyelonephritis, in which cure or improvement in manifestation and a negative urine culture were seen in about 98% of patients treated with meropenem-vaborbactam. Meropenem-vaborbactam 4g IV q8hr for upto 14 days; infused over 3hrs is to be recommended for better results in this patient [9].

4. Clinical Interventions

Joint pain of the patient was not considered, focused or evaluated and was not resolved.

5. Conclusion

Since the sodium levels did not restore after fluid correction, the physician prescribed Tolvaptan which will restrict sodium loss through urine. Tolvaptan was given along with Diltiazem at night which has drug interaction as diltiazem increases the activity of tolvaptan by pharmacodynamic synergism. Even after treating the patient with this, much improvement in the sodium levels was not seen.

Coming to the antibiotic therapy selection, the patient was given Ceftriaxone 1 gm twice a day for 6 days. Initially, it was given as an empirical therapy but later it turned out to be organism-specific therapy as Ceftriaxone 1-2 gm IV q24 h is the therapeutic regimen to be given for pyelonephritis which shows *E. coli* + culture report.

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Conflict of Interest

None

Ethical Approval

None

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Abbreviations

- UTI: Urinary Tract Infection
- PCV: Packed Cell Volume
- ALP: Alkaline Phosphatase
- aPTT: Activated Partial Thromboplastin Time
- KUB: Kidney, Ureter and Bladder
- CT: Computed Tomography
- VUJ: Vesicoureteric Junction
- IV: Intravenous
- PO: Per oral
- BD: Bis in die
- OD: Once a day
- HS: Hora somni
- CFU: Colony Forming Unit

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