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FACTORS INFLUENCING RECURRENT REFLUX ACUTE PYELONEPHRITIS IN PATIENTS WITH JJ URETERAL STENT AFTER DISCHARGE

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Abstract - The vesicoureteral reflux (VUR) after the insertion of a JJ stent is a pathological entity characterized by the impossibility of the vesicoureteric *junction* (VUJ) to exhibit its sphincterian functioning that allows the unidirectional flow of urine from the ureter to the bladder. This happens as long as the catheter is in place, and after its suppression due to traumatization of the ureterovesical junction, which loses its tonicity and ability to ensure urinary unidirectional flow. Reflux acute pyelonephritis is the acute inflammation of the renal tract and parenchyma resulting from stagnation of infected urine for long periods of time due to vesicoureteral reflux. We have noted multiple cases which, after the insertion of a JJ stent, presented reflux acute pyelonephritis due VUR, we considered the causes favoring these aspects. We focused on the frequency of reflux acute pyelonephritis and identified factors that could be used to advise patients with JJ stents.

Key words: vesicoureteral reflux; JJ stent; reflux acute pyelonephritis.

INTRODUCTION

The VUR after the insertion of JJ stent has been described by Damiano et al. (2002) and Grosi et al. (2006). The reflux acute pyelonephritis is characterized by acute inflammation of the renal tract and parenchyma and has been associated sometimes with kidney failure (Paz et al., 2005, Uvin et al., 2011). Management of this condition consists of introduction of a urethro-bladder Foley type catheter to prevent vesical filling, annulling the vesicoureteral reflux, and directed and focused antibiotherapy with new generation antibiotics (Akay et al., 2007, Tanriverdi et al., 2011). Antibiotic therapy and hospitalization costs are increased in the aforementioned cases. We have noted multiple such cases which, after the insertion of a JJ stent, returned after a period of time presenting reflux acute pyelonephritis, due to the so-called vesicoureteral reflux (Ahallal et al., 2010) in the present report we tried to give a careful consideration of the favoring causes for these aspects and put further focus on their future removal, with extremely beneficial consequences for both the patient and the hospital budget.

MATERIALS AND METHODS

We focused on 84 cases that developed reflux acute pyelonephritis after days/weeks from discharge. We targeted the following aspects: the cause for the in-

sertion of JJ stent, prior attempts of failed or successful catheterization, temperature at the insertion of the JJ, the summary of urine at the insertion of the JJ, dwelling place (urban/rural) with regard to the conditions of hygiene, renal function at the time of JJ insertion, the degree of anemia, the number of leukocytes, urine culture, period of admission, the difficulty at the catheterization (a difficult catheterization produces aggressive trauma on the UJV. In the present study we had a 67 % patients in this situation), associated pathology, as it can influence to a certain extent the appearance and maintenance of the inflammatory process either by lowering the body's immune capacity, by affecting renal vasculature, or stressing the decline in renal perfusion.

The main reason for the insertion of the JJ stent was obstructive ureteral stones with intense recurrent pain or infected ureterohydronephrosis.

RESULTS AND DISCUSSION

Of the 84 patients, 37 were men and 47 were women

Table 1. Patient distribution according to sex ratio.

Gender	Frequency	Percentage
Male	37	44.
Female	47	56
Total	84	100

The reflux acute pyelonephritis was apparently a more predominant pathology in females, as has been reported (Vallejo et al., 1998). Women are more likely to develop urinary infections because of anatomical conditions (short urethra, proximity to anus, sexual activity) (Merlo et al., 2011, Song et al., 2011).

The data in Table 2 show predominance of the pathology for the age groups of 60-69 years old and 20-29 years with 17 cases each, followed by group 40-49 years with 14 cases, then group 50-59 years old with 13 cases, group 30-39 years with 11 cases, group 70-79 years with 8 cases and with only 2 cases each the age groups 0-19 and 80-89 years of age.

Table 2. Patient distribution according to age.

		Frequency	Percentage	Cumulative Percentage
Valid	0-19 years	2	2.4	2.4
	20-29 years	17	20.2	22.6
	30-39 years	11	13.1	35.7
	40-49 years	14	16.7	52.4
	50-59 years	13	15.5	67.9
	60-69 years	17	20.2	88.1
	70-79 years	8	9.5	97.6
	80-89 years	2	2.4	100
	Total	84	100	

The average age of the patients was 47.64 (standard error = 1.945), the most common age was 42 years (standard deviation = 17.828), the minimum age was 19 years, the maximum age was 87 (Table 3, Fig. 1).

Table 3. Descriptive statistical data with regard to the age of the study groups.

Valid	84
Missing	0
Mean	47.64
Std. Error of Mean	1.945
Median	47.50
Mode	42
Std. Deviation	17.828
Variance	317.823
Range	68
Minimum	19
Maximum	87

The status of the immune system should be taken into account, as well as personal body hygiene (Giannarini et al., 2011). Therefore, a potentially important aspect was the distribution of patients according to their place of residence. Contrary to our expectations of lower hygiene in rural areas, we observed that the pathology predominated in patients from urban areas. Thirty-five patients with reflux acute pyelonephritis were from rural areas and 49 of were from urban areas (Table 4).

We also performed a distribution of cases depending on the etiology of obstruction for which the JJ catheter insertion was practiced (Table 5). Of

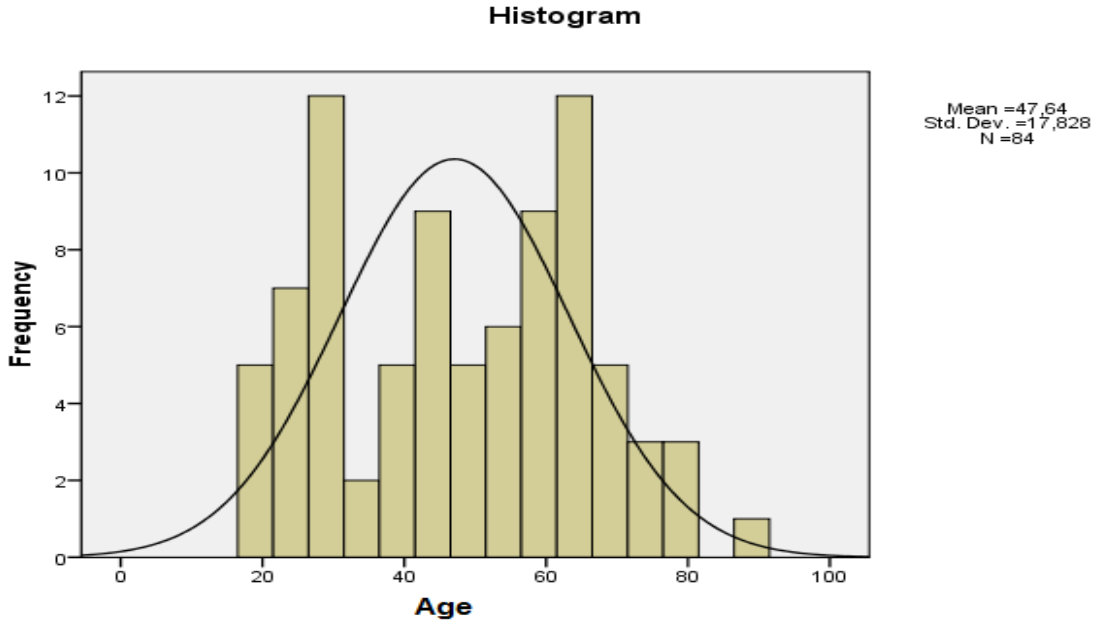

Fig. 3. Distribution of patients according to age.

Table 4. Patient distribution according to the environment of region.

	Frequency	Percentage	Cumulative Percentage
Urban	49	58.3	58.3
Rural	35	41.7	100
Total	84	100.	

prevailing importance for the obstruction for which catheterization and insertion of double J stent were performed is the lithiasis, which was followed by pregnancy, congenital HN, tumor invasion/compression, stenoses, retroperitoneal fibrosis, retroperitoneal phlegmon, etc. Out of the total cases, for three of these the cause of obstruction wasn't identified

Ureteral catheterization is a trauma of the ureterovesical junction and, in particular of the ureteral orifice (Ringel et al., 2000). We could observe a slight increase of the spontaneous calculi eliminations in a significant percentage of patients with ureteral lithiasis (61 %). This could suggest that the crossing of

Table 5. The distribution of cases depending on the etiology of obstruction for which the JJ catheter insertion was carried out.

	Frequency	Percentage	Cumulative Percentage
Lithiasis	58	69.9	69.9
Pregnancy with hydronephrosis	6	7.2	77.1
Congenital hydronephrosis	5	6.0	83.1
Tumoral compression/invasion	4	4.8	88.0
Stenosis	3	3.6	91.6
Unspecified cause	3	3.6	95.2
Meanderings	1	1.2	96.4
Retroperitoneal fibrosis	2	2.4	98.8
Retroperitoneal phlegmon	1	1.2	100
Total	83	100	

the calculi through the junction could have resulted in lesions affecting the antireflux mechanism.

Until now there was not discussed the length/ size of the loop of the JJ probe (stent) inserted in the bladder. We use stents that are available in the emergency unit. However, stents should be linked to the patient's height. Thus, a stent that is too long could favor germ migration in renal parenchyma, causing infection and forcing patients to return to the clinic (Garrido et al., 2008, Shigemura et al., 2012).

What do we propose? Since X-ray examination cannot measure the length of vesical extremity, we suggest to measure the angle formed between the main direction of the JJ stent/probe and the direction of the loop inside the bladder. In this way, the higher the values of this angle, the bigger the chances that the ureter be more beant. Additionally, it could extremely important to purchase probes to suit individual patients, as this can be a solution for significant complications for the patient and cost savings for hospitals, if the long loop inside the bladder is shown to be a determining factor. Thus, all of these aspects could be also important in order to advise in the future the patients with JJ stents which are to be discharged.

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