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NON INFECTIOUS COMPLICATIONS OF CONTINUOUS AMBULATORY PERITONEAL DIALYSIS

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ABSTRACT :

Introduction: Continuous ambulatory peritoneal dialysis has proven to be as effective as hemodialysis. However, it is associated with several complications. The aim of this study is to evaluate the prevalence and outcome of complications in patients treated with peritoneal dialysis at our center.
Material and methods: A retrospective study between January 2007 and February 2015 at the nephrology, dialysis and renal transplantation department of Ibn Sina university. Predisposing factors and long-term outcomes were analyzed.
Results: Fifty two mechanical complications were noted among thirty eight patients between June 2007 and February 2015. Migration was the most common (23 cases) followed by obstruction, hernia and dialysate leakes in respectively 9, 7 and 6 cases. We have also noted 2 cases of hemoperitoneum, 3 catheter perforation and 2 cases of externalization. Onset time of complications was 25,4 ± 12,7 months.
Conclusion: this study proves the interest of the prevention of mechanical complications in peritoneal dialysis. This requires a periodic retraining of patients and caregivers.

Kaywords : Non infectious, peritoneal, complications, treatment

INTRODUCTION:

The use of peritoneal dialysis for the management of end-stage renal failure remains widespread, especially in low-resource settings, because of its lower cost.
Peritoneal dialysis is introduced in Morocco for the first time in 1980, and then quickly abandoned. Through a pilot experiment at the Ibn Sina University Hospital of Rabat, started in 2006 to respond to medical and social needs, peritoneal dialysis was developed as a new technique for renal replacement therapy [1].
It provides to patients the choice of an effective home dialysis modality with self-autonomy and supports optimal quality of life [2].
The three essential elements of peritoneal dialysis are:
-A viable peritoneal cavity lined by a functional membrane
-Access to the peritoneal cavity, usually by means of indwelling catheter
-Dialysis fluid and delivery mechanisms

Several studies have examined the factors influencing dialysis technique success. Majority of the data available is concentrated around the effect of peritonitis episodes on peritoneal membrane. Data on the factors affecting peritoneal dialysis catheter survival and mechanical complications are sparse.
Mechanical complications of continuous ambulatory peritoneal dialysis are frequent. Their diagnosis is easy and their evolution is mild but they can sometimes lead to the technique failure and a change to hemodialysis in approximately 20% of cases [3-4].
The aim of our study is to analyze the prevalence of mechanical complications in our center and their outcome on the technique survival.

MATERIAL AND METHODS:

This retrospective study was carried out in eighty nine patients with end renal kidney disease

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undergoing continuous ambulatory peritoneal dialysis between January 2007 and February 2015.
These complications are diagnosed by malfunction of catheter, defined by one of the three situations:
-An impossible drainage after normal infusion;
-An impossible or incomplete drainage with slow speed after slow infusion;
- Impossible drainage and infusion.
We have analyzed demographics profile of patients, catheter implantation method, duration of continuous ambulatory peritoneal dialysis, mechanical complications, predisposing factors, treatment and outcome on the technique survival.
These complications included migration or obstruction of peritoneal dialysis catheter, inguinal or umbilical hernias, early or late leaks dialysate, hernia or perforation of catheter and rarely the hemoperitoneum.
Statistical analysis was performed using SPSS version 21. Quantitative variables were expressed as mean and standard deviation. Qualitative variables were expressed as numbers and percentages.

RESULTS:

Since the opening of the peritoneal dialysis unit, a total of 89 double-cuff Tenckhoff catheters were surgically implanted. Thirty eight patients developed a total of 52 non infectious complications. The average age was 48, 6 ± 11, 7 years and the sex ratio was 3,7 with a male predominance (Table I). Only one patient has an abdominal surgery type cesarean prior to peritoneal dialysis.

Table I. Patients characteristics

Characteristics	Values
Age	48,6 ± 11,7
Sex ratio	30/8
Diabetes mellitus	42,1%

Migration of catheter was the most common mechanical complication observed in 23 cases. The main contributing factor was constipation (21 cases).
Treatment was based on transit accelerators in all with a favorable evolution in 20 cases. The other three cases have required a laparoscopy replacement.
Obstructions were observed in 9 cases caused by fibrin deposits in 5 cases and epiploic aspiration in four cases.
Treatment was based on heparin, dose of 1 ml/liter of dialysate in five cases, while the treatment of epiploic aspiration was surgical.

Hemopeitoneum and dialysate leaks were observed respectively in 2 and 6 cases. Evolution after a temporary cessation of exchanges for an average duration of 5 days or after stop treatment was favorable.
Catheter perforation is accidentally caused by using chisel observed in 3 cases. It was treated by shortening of catheter in 2 cases and catheter removal in 1 case.
Hernia was noted in 7 cases. Six of them underwent surgical treatment.
The reason and predisposing factors of non infectious complication are given in table 2.

Table II. Predisposing factors and evolution of peritoneal dialysis non infectious complications.

	Predisposing factors	Treatment/evolution
Migration	Constipation: 21 cases Spontaneous: 2 cases	Laxatives: 20 cases Laparoscopy: 3 cases
Obstruction	Fibrin deposit: 5 cases Epiploic aspiration: 4 cases	Intra peritoneal heparin: 5 cases Surgical unblocking: 4 cases
Dialysate leak	Early peritoneal exchange; 4 cases Diabetes: 2 cases	Suspension exchange: 5 cases Reducing volume: 1 case
Catheter perforation	Accidental: 3 cases	Catheter removal: 1 case
Hernia	Intra peritoneal hypertension: 7 cases	Decrease volume infusion + Surgical cure: 6 cases
Hemopeitoneum	Anticoagulant treatment: 1 case Abdominal trauma: 1 case	Stop treatment
Externalization	Traction on catheter: 2 cases	Coat: 2 cases

DISCUSSION:

Tenckhoff catheter insertion for continuous ambulatory peritoneal dialysis is a procedure associated with significant surgical morbidity.

From the insertion of the peritoneal catheter through to the actual treatment, there are pitfalls and complications that may adversely affect the patient and compromise the success of the dialysis [5].
These complications are classified into two groups on the basis of onset from the time of insertion of

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catheter: Early onset (one to four months) and late onset [6].
Early complications arising soon after the catheter implantation are frequently related to the catheter implantation procedure, due to congenital anatomic abnormalities and to the increased intra abdominal pressure generated by infusion of dialysate [6].
The prevalence of mechanical complications in our series was different compared to the other series published in the literature [7-8]. (Table 3)

Table III: Comparison of mechanical complications with literature data

	Ibn Sina	Moreiras Plaza M (1999)	B. Branger (2000)
Years	13	11	8
Patients	38	80	89
Non infectious complications	52	137	32

Catheter dysfunction prevalence varies between 0% - 22% depending on the type of catheter and the insertion technique [9-10].
In our series the catheter migration was the most common cause; it represents 44,2% of mechanical complications followed by catheter obstruction in 17,3% of cases
Hernias are less common in our series, presumably because of the lower inra-abdominal pressure during recumbency. Their frequency increases with age, obesity and the increase of intra-abdominal pressure may be secondary to chronic constipation, and dialysate infusion.
Hemoperitoneum in our study was infrequent with a spontaneous resolution. It is considered as a benign complication and not a risk factor for peritonitis or failure of the technique [11].
Majority of these complications were treatable and did not interfere with the catheter survival. Some measures would prevent these complications. (Figure1)

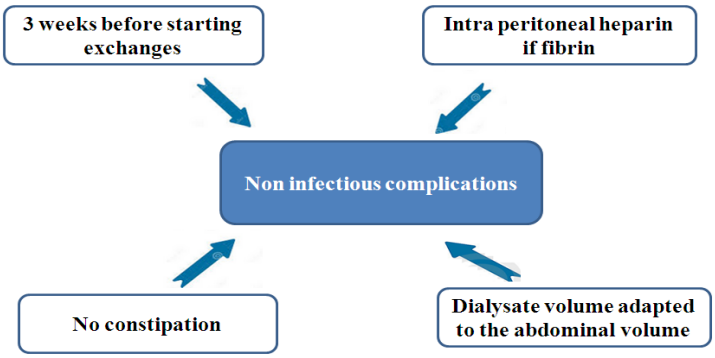

Figure 1: Preventive measures of non infectious complications

CONCLUSION

Continuous ambulatory peritoneal dialysis plays an integral role in renal replacement therapy with its many advantages to patients; however, there are significant adverse risks associated with it, leading to serious risk of morbidity and mortality.
Early recognition of complications, careful evaluation of the patients, attention to the implantation technique and rigorous care during the intra and post-operative period can markedly reduce the prevalence many of these complications.

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