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***Ureteric stent vs Nephrostomy for acute renal desobstruction:
National expert-based consensus and evaluation of quality of
life***

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***Ureteric stent vs Nephrostomy for acute renal desobstruction:
National expert-based consensus and evaluation of quality of
life***

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Nota introdutória:

O presente trabalho será submetido para apresentação no Congresso que celebra os 100 anos da Associação Portuguesa de Urologia e será submetido para artigo a uma revista indexada.

Abstract

Introduction: There are no guidelines to support decision in upper urinary tract obstruction. Published reviews provide conflicting evidence regarding the ideal way to drain upper urinary tract. We aimed to provide a Portuguese urological consensus on dealing with upper urinary tract obstruction, defining indications and best method of decompression in each clinical scenario. We also evaluated the quality of life in patients with a percutaneous nephrostomy and retrograde ureteral stent.

Materials and Methods: We sent a questionnaire contemplating different clinical scenarios of upper urinary tract obstruction to all Portuguese urologists. Answers were in the form of a Likert scale and were categorised into areas of “clear agreement” (>75% agreement), “broad agreement” (50-75%) and “no broad consensus” (less than 50%). Additionally, we conducted an observational retrospective study with 76 patients who have been submitted to percutaneous nephrostomy or retrograde ureteric catheterization and answered a Quality-of-Life questionnaire.

Results: We received replies from 101 urologists. There was a clear agreement regarding the need for upper urinary tract decompression with fever, sepsis, Acute Kidney Insufficiency, elevated inflammatory parameters (CRP >5mg/dl) and single functioning kidney. There was clear agreement regarding percutaneous nephrostomy as the best method when facing advanced oncological disease. On the other hand, retrograde catheterization was considered the best method for patients with coagulopathy, taking oral antiaggregant or anticoagulants, and mild hydronephrosis. Clinicians broadly recommend ureteroscopy when facing lithiasis refractory to medical expulsive treatment, not recommending this intervention in case of fever, sepsis and increased inflammatory parameters.

Urologists clearly agree that ureteral stent better preserves the quality of life. However, we found that ureteral catheterization and percutaneous nephrostomy have a similar negative effect on the various domains of the quality-of-life assessment. Nevertheless, percutaneous nephrostomy is associated with worse self-perception of health and self-care.

Discussion: Our study allowed us to determine consensus on upper urinary tract decompression in the Portuguese urologist experts. These conclusions can and should be used as the ground for later development of specific guidelines.

Keywords: Percutaneous Nephrostomy, Retrograde ureteric stent, Ureteroscopic Surgery, Health-Related Quality Of Life, Consensus Development

Resumo

Introdução: Não existem atualmente diretrizes para apoiar a decisão em matéria de obstrução do trato urinário superior. As publicações sobre o assunto fornecem evidências contraditórias, apenas concordando que não existe uma forma ideal de desobstruir o trato urinário superior. O presente estudo visou proporcionar um consenso urológico português sobre estratégias de desobstrução do trato urinário superior, definir indicações sobre o melhor método de descompressão em cada cenário clínico. Pretendeu ainda avaliar a qualidade de vida em doentes com nefrostomia percutânea e cateter uretérico retrógrado.

Materiais e Métodos: Um questionário especialmente criado para o efeito foi enviado por via eletrónica a todos os urologistas portugueses. O questionário contemplava diferentes cenários clínicos de obstrução do trato urinário superior, para o que se pedia resposta numa escala Likert, categorizadas como de "acordo claro" (>75% de acordo), "amplo acordo" (50-75%) e "nenhum consenso geral" (menos de 50%). Além disso, foi conduzido um estudo retrospectivo observacional com 76 pacientes que foram submetidos a nefrostomia percutânea ou cateterização uretérica retrógrada, que responderam a um questionário sobre a Qualidade de Vida.

Resultados: Obtivemos 101 respostas. Os urologistas portugueses concordam claramente na indicação de descompressão do trato urinário superior em contexto de febre, sépsis, insuficiência renal aguda, parâmetros inflamatórios elevados (PCR >5mg/dl) e rim funcional único. Verificou-se uma clara concordância na preferência de nefrostomia percutânea como melhor método quando se enfrenta uma doença oncológica avançada. Por outro lado, a cateterização retrógrada foi definida como o melhor método para doentes com coagulopatia, a tomar antiagregantes orais, anticoagulantes, ou com hidronefrose ligeira. Os médicos não recomendam a ureteroscopia primária em caso de febre, sepsis e aumento dos parâmetros inflamatórios. Embora recomendem em casos de litíase refratária ao tratamento médico expulsivo.

Os urologistas concordam claramente que o cateter uretérico preserva mais a qualidade de vida. Embora a cateterização uretérica retrógrada e a nefrostomia percutânea tenham um efeito negativo semelhante nos vários domínios da avaliação da qualidade de vida, a nefrostomia percutânea está associada a pior auto percepção da saúde e capacidade de autocuidado.

Discussão: O nosso estudo permitiu-nos determinar áreas onde existiu consenso sobre a descompressão das vias urinárias superiores nos urologistas portugueses. Estas conclusões podem e devem ser utilizadas como base para o desenvolvimento posterior de diretrizes específicas.

Palavras-chave: Nefrostomia Percutânea, Cateterização Uretérica Retrógrada, Ureteroscopia, Qualidade de vida relacionada com a saúde, Desenvolvimento de Consenso

LIST OF ABBREVIATIONS AND ACRONYMS

AKI – Acute Kidney Injury

CHUC- Coimbra's Hospital and University Centre

MET- Medical Expulsive Therapy

PCN- Percutaneous Nephrostomy

PCS - Pelvicalyceal system

QoL- Quality of life

RUC - Retrograde ureteral catheterization

URS – Ureteroscopy

UUT- Upper urinary tract

UUTO- Upper urinary tract obstruction

INTRODUCTION

Upper urinary tract obstruction (UUTO) is a common scenario in clinical practice. It is caused by a variety of diseases, namely lithiasis, tumours and strictures.(1) Multiple factors may influence both the need for decompression of an obstructed collecting system and the urgency of procedure. To our knowledge, there is limited agreement among clinicians about the optimal method, timing of intervention and even some indications for decompression.

Both percutaneous nephrostomy (PCN) and retrograde ureteral catheterization (RUC) have firmly established efficacy for decompression of upper urinary tract (UUT).(2) Furthermore, the high success and low complication rates of these drainage procedures have made both alternatives attractive. However, there is great disagreement on which of the two methods is best for the patient and for a specific clinical setting.(3–5)

There are currently insufficient studies that directly compare both methods. Two randomized studies were performed in patients with obstructive ureteral calculi and infection, but with a limited number of patients included.(2,6) *Pearle* and colleagues concluded that neither modality demonstrated superiority in promoting a more rapid recovery after drainage, and that the decision of which mode to use may be based on logistical factors, surgeon preference and stone characteristics.(2) Another study conducted by *Mokhmalji* demonstrated that percutaneous nephrostomy was superior to ureteral stents in preserving quality of life. They also demonstrated that patients with PCN needed shorter periods of intravenous antibiotics to normalize inflammatory parameters and temperature.(6) PCN is a large calibre drainage tube that can be easily placed under local anaesthetics and with a success rate around 100%, which are clear advantages. On the other hand, RUC has better safety record and avoids external tubes and collection devices.(2)

Most recent studies which evaluated the QoL showed a trend favouring PCN.(6,7) In a study carried in a subgroup of oncological patients with obstruction, the quality of life was similar between the group of patients submitted to PCN and RUC.(7)

Acute upper urinary tract obstruction is most commonly due to calculus and most patients with UUTO have urinary lithiasis. Urolithiasis is common in modern society and the risk of stone formation in an individual is estimated to be between 1-20%.The prevalence of ureteric obstruction has been increasing in recent decades, with a very high recurrence rate of 50% at 5 years and 80-90% at 10 years.(11) Therefore, it is imperative that treatment of the acute crisis and lithiasis itself are both optimised. This will result in the least suffering for patients, low complications rates and best clinical outcomes.

Septic episodes secondary to an infected obstructed pelvicalyceal system (PCS) constitute a major life-threatening complication related to UUTO and/or their treatment.(12) Hydronephrosis and infection can lead to systemic inflammatory syndrome, sepsis, septic shock, and death. Urosepsis is an independent risk factor for septic shock and mortality in patients with urinary tract obstruction, therefore urgent decompression of the pelvicalyceal system is a mandatory life-saving

measure. Complete obstruction of the renal drainage system can also lead to acute kidney injury (AKI) and definitive loss of kidney function if left untreated. Treating the obstruction in these cases prevents the loss of renal function. Furthermore, refractory pain in renal colic occasionally requires urgent decompression.

The existing guidelines by European Association of Urology (EAU) recommend definitive treatment of the cause of obstruction after infection has been resolved. (8) However, further to the emerging role for the use of primary ureteroscopy (URS) in the management of non-infective ureteric stones,(9) recent data showed that URS can effectively and safely manage febrile hydronephrosis due to ureteral stones disease, when combined with strong antibiotics in select clinical situations.(7,10)

Based on the above findings, the decision to choose the best method for decompression of the renal collecting system depends on the clinical scenario, the physician's expertise, and even hospital environment and costs. That decision is made without guidelines to give full confidence to the clinician about the best method for decompression and the perfect timing, justifying the promotion of a consensus from Portuguese urologists.

This work aims to build a consensus among Urologists in Portugal, that may be the basis for subsequent development of guidelines to support the decision on the best method of upper urinary tract clearance, according to the clinical situation and intrinsic factors of the patient. Secondly, we intend to evaluate the quality of life of patients submitted to ureteric decompression, either by PCN or RUC (double J stent), which is a key element to incorporate in the decision-making process.

MATERIAL AND METHODS

Observational clinical study approved by Faculty of Medicine, University of Coimbra's ethical committee (CE-099/2022). The study was conducted in two independent moments: an expert-based opinion survey and patient quality of life assessment.

Sample selection and data collection

Expert-based Opinion Survey

Opinion based questionnaire was available via Google Forms and sent to all Portuguese Urologists registered on Portuguese Urological Association (APU), with the aim of surveying their opinion on the method to be preferred in different clinical scenarios. All gathered data was anonymised. Written informed consent to participate in the study was collected.

Survey was designed by Urologists with experience in UUTO. The final questionnaire is displayed on Annex 1. All respondents were invited to answer 6 questions about their profession and experience, followed by 4 questions about their working place and resources of urology unit. Three sets of questions were provided in the survey. First, clinicians were invited to decide when to drain the urinary tract, given different clinical scenarios. Answers were given in the form of a Likert scale with 5 levels (Totally agree to decompress to Totally disagree to decompress) and were followed by an assessment of the priority of each decompression (<1h; 1-3h; 3-12h; >12h). Following this group of questions, urologists were invited to choose the preferable method (PCN or RUC) for the previously designed clinical scenarios. Lastly, five questions directed to primary URS role were incorporated, to define the possibility of choosing this option over PCN or RUC.

Data analysis regarding agreement was categorised into three degrees of agreement: "clear agreement" (>75% agreement), "broad agreement" (50-75%) and "no broad consensus" (less than 50%).

Quality-of-Life assessment

Another questionnaire was provided to patients in Coimbra's Hospital and University Centre (CHUC), aged 18 year or older, who had experienced PCN or RUC for at least 1 month. The first group consisted of 36 patients carrying a PCN, and the second group involved 40 patients who had undergone RUC. All gathered data was anonymised and written informed consent to participate in the study was collected at the time of interview.

Quality of life assessment was performed by interview with one of the investigators. Data was gathered between October 1st to December 15th, 2022. The example of the interview questionnaire is displayed on Annex 2. Summary demographic and clinical data was collected (age, gender, work status, cause of obstruction, method of decompression, time passed since the procedure, ECOG and comorbidities). These parameters were followed by an adapted

Portuguese version of the EQ-5D-5L questionnaire. A brief health status measure composed of 5 questions with Likert response options (descriptive system) and a visual analog scale (EQ-VAS). The descriptive system covers 5 dimensions of health (mobility, self-care, usual activities, pain or discomfort, and anxiety or depression) with 5 levels of severity in each dimension (no problems, slight problems, moderate problems, severe problems, and unable to perform or extreme problems). Answers between 1 and 4 were classified as positive for development of some sort of problem after the desobstructive procedure. The EQ-VAS scale is an instrument where patients are asked to rate their own health from 0 to 100 (the worst and best imaginable health, respectively).

Statistical Analysis

Data collection and statistical analysis were performed using the SPSS version 26. Descriptive analyses were performed using standard summary statistics. Specialist questionnaires were evaluated using standard summary statistics according to previously defined degrees of agreement. Regarding the quality-of-life assessment, EQ-5D-5L parameters were compared using Chi-square test for independence (with Yates' Continuity Correction) and EQ-VAS with Independent-samples t-test. Presenting p values and 95% confidence intervals. A p value < 0.05 was considered statistically significant.

RESULTS

Expert-based Opinion Survey

We obtained a total of 101 answers, covering almost 30% of national urology specialists. In the study population, 75% work in a central or metropolitan emergency department and carry out assistance activity in the emergency department. A total of 70% of the answers were given by specialists and the remaining 30% by residents. Almost all residents had more than 3 years of experience. Most answers (55%) were given by clinicians with more than 10 years of experience in urology and 97% of the answers were given by doctors who perform PCN and RUC in their daily clinical practice. Most urologists (54%) report that there are a minimum of 2 patients/day requiring UUT desobstruction in their hospital.

Indications for upper urinary tract decompression

Indications for UUT decompression				
	No	No opinion	Yes	Time until decompression
Fever (>38°)	0%	1%	99%	64% at <3h
Signs of sepsis	0%	0%	100%	85% at <3h
AKI	5%	20%	75%	54% at 3-12h
AKI and complication	2%	2%	96%	83% at 1-3h
Leucocytosis and high CRP	2%	17%	81%	N/Ag
Refractory to MET	11%	23%	66%	64% at >12h
Single functioning kidney	0%	0%	100%	63% at <3h

Table 1- Opinions regarding the adequacy of UUT decompression according to clinical scenarios

C/Ag – Clear Agreement; B/Ag – Broad agreement; N/Ag – No Agreement

Colour legend:

■ Clear Agreement; ■ Broad Agreement; ■ No Agreement

Urologists had clear agreement that decompression of the upper urinary tract is mandatory with fever (99% agreement) and clinical signs of sepsis (100% agreement). In case of fever, there was a broad agreement it should be performed in less than 3 hours (64%) and a clear agreement it should be performed in a time interval of less than 12 hours (99%). When clinical signs of sepsis are present, there is a clear agreement that it should be performed in less than 3 hours (85%). Most urologist answered it should be done in less than 1 hour (66%).

Regarding the need to decompress the UUT when the patient presents with AKI (increase of serum Cr >50% in 48h or diuresis <0.5ml/kg/h for >6h), there was a clear agreement that unblocking the UUT should be performed (75%). When complications are present, such as fluid overload or altered state of consciousness, 96% urologist agree with decompression. Regarding time to decompression, AKI without complications can wait more than 3 hours (broad agreement), with 18% of the clinicians stating that it could even be deferred to the next day. When complications are present, 84% said it should be done in less than 3 hours, reaching a clear agreement.

There was also clear agreement (80%) that decompression should take place in presence of leucocytosis and increased CRP, with 93% (clear agreement) stating that it should be performed within the first 12 hours. When questioned about the CRP values that should motivate UUT decompression, there was a clear agreement that UUT decompression should not be performed with CRP values lower than 5mg/dl (89%) in the absence of symptoms or other laboratory parameters. Analysis of CRP values is displayed on figure 1.

CRP values that motivate UUT unblocking

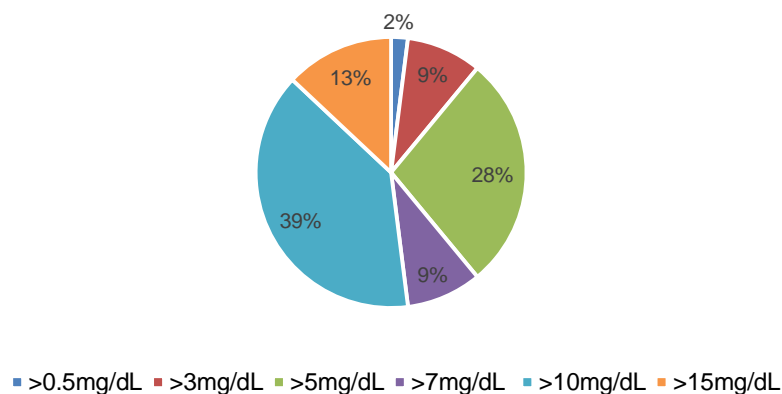


Figure 1- CPR values believed to justify UUT unblocking

If the patient presents with obstruction caused by lithiasis, refractory to medical expulsive therapy (MET), 66% would clear the UUT and 64% agreed to postpone the procedure to the following day, thus reaching a broad agreement for both questions. If the patient is on medical expulsive therapy, 74% think it is appropriate for the patient to wait 3 or more weeks until desobstruction (broad agreement).

Regarding UUT decompression when the patient has a single functioning kidney, there was a clear agreement (100%) that desobstruction should be performed, with 98% of the clinicians agreeing that it should be done within the first 12 hours (clear agreement).

Best method for decompression of UUT				
	PCN	RUC	Equally adequate	Indication
Fever (>38°)	7%	27%	66%	Equally Adequate
Signs of sepsis	27%	19%	54%	Equally Adequate
Septic shock	44%	18%	38%	N/Ag
Coagulation alterations	1%	98%	1%	RUC
Antiaggregant therapy	1%	84%	15%	RUC
Anticoagulant therapy	1%	97%	2%	RUC
Slight Hydronephrosis	4%	94%	2%	RUC
Pregnancy	49%	35%	16%	N/Ag
Obstruction by blood clots	67%	11%	22%	PCN
Obstruction and renal abscess	60%	20%	20%	PCN
Pyonephrosis	67%	12%	21%	PCN
Ureteric Calculus <5mm	2%	76%	22%	RUC
Ureteric Calculus 5-10mm	3%	70%	27%	RUC
Ureteric Calculus >10 mm	18%	48%	34%	N/Ag
<i>Steinstrasse</i>	34%	33%	33%	N/Ag
Locally advanced pelvic cancer	80%	8%	12%	PCN
Adenopathic conglomerates	61%	20%	19%	PCN
Preserve quality of life	12%	85%	3%	RUC
Males	3%	32%	65%	Equally Adequate
Females	2%	38%	60%	Equally Adequate
Young	2%	74%	24%	RUC
Elderly	13%	38%	49%	N/Ag
Professionally active	3%	82%	15%	RUC
Palliative care	43%	29%	28%	N/Ag
Dependent in daily activities	35%	38%	27%	N/Ag
Obese	3%	88%	9%	RUC

Table 2- Opinions regarding the best method for UUT decompression giving different clinical scenarios

C/Ag – Clear Agreement; B/Ag – Broad agreement; N/Ag – No Agreement

Colour legend:

■ Clear Agreement; ■ Broad Agreement; ■ No Agreement

Regarding the section of the questionnaire that aimed to assess the opinion about the best technique to decompress the UUT, there was broad agreement that both methods were equally adequate in case of fever and sepsis. Among the few clinicians who chose one of the procedures over the other in case of fever, 79% chose to submit the patient to RUC. In case of

sepsis, of those who chose one of the methods, 59% chose PCN. Septic Shock, on other hand, didn't meet agreement. Although when one method is chosen, 72% chose PCN as the most suitable option.

There was a clear agreement that RUC is superior in patients with coagulation alterations (98%), undergoing antiaggregant medication (84%), taking oral anticoagulants (NOAC/ Warfarin) (97%) or presenting with slight hydronephrosis (93%). Regarding UUT unblocking during pregnancy, although most stated that it is better to perform PCN (49%), no broad agreement was achieved. It was broadly stated that PCN is preferred in cases of obstruction with blood clots (67%), renal abscess (60%), and pyonephrosis (67%).

In cases of UUTO caused by calculi, if the size of the stone is <5mm, there is a clear agreement that RUC is superior (75%). With calculus of 5-10mm, RUC is also the preferable method (70%, broad agreement). In case of calculus with > 10mm or *Steinstrasse*, no agreement was reached.

There was a clear agreement on performing PCN (80.2%) in the presence of a locally advanced tumour, and a broad agreement on performing PCN (60%) in the context of adenopathic conglomerates.

When asked about the method that most preserves patient's quality of life, 85% of the clinicians agree that RUC is the superior method (clear agreement).

We reached broad agreement that, for both male and female patients, both methods are equally adequate. For young adult population, 74% of the clinicians consider that RUC is more suitable than PCN (broad agreement), as well as for a professionally active patient, where there was clear agreement (82%) that RUC is superior. In obese patients, 88% agreed that RUC is the superior method (clear agreement). However, for an elderly patient, we did not reach any agreement. In both palliative care and dependent patients, no agreement was reached.

Primary URS in patients presenting with lithiasis and:			
	No	No opinion	Yes
Fever	95%	3%	2%
Sepsis with urinary starting point	96%	1%	3%
AKI	34%	15%	51%
Refractory to MET	2%	14%	84%
Increase of inflammatory parameters	79%	12%	9%

Table 3- Opinions regarding the adequacy of primary URS to unblock UUTO giving different clinical scenarios

Colour legend:

■ Clear Agreement; ■ Broad Agreement; ■ No Agreement

Regarding UUT unblocking in cases of ureteric lithiasis, when asked about the role of primary URS, there was clear agreement that it should not be performed with fever, signs of sepsis and increased inflammatory parameters in blood analysis. We reached a broad agreement that, in the case of lithiasis and AKI, it may be appropriate to use primary URS. There was also clear agreement it is appropriate in case of lithiasis refractory to MET.

Quality-of-Life Self-assessment

We included a total of 76 patients who underwent UUT decompression with PCN or RUC. Nephrostomy was performed in 36 patients (47%) and retrograde catheterization was performed in 40 patients (53%). Median patient age at the time of the assessment was 62 years (range: 26 to 84) and there was a similar proportion of males and females. The most common cause of obstruction was lithiasis (48%), followed by neoplasia/tumour (21%). Most patients had an ECOG performance status of 0-1 (76%), and only a short percentage of patients were employed at the moment of the interview (30%). Median time between decompression and interview was 9 months.

Before testing quality of life, we compared patient's demographic characteristics (PCN vs RUC). The two groups compared were similar in terms of ECOG status ($p=0.98$), time from decompression ($p=0.29$) and working status ($p=1.00$). There was, however, a significant difference in the motive for desobstruction ($p<0.05$). Lithiasis was the cause for desobstruction in 76.5% of patients submitted to RUC, whereas only 23.5% of these patients were submitted to PCN. There was also a significant difference of ages between the two groups. PCN group showed a median age of 66 years, ($M = 65.64 \pm 12.97$) whereas in the RUC group, median age was 58 years, ($M = 58.07 \pm 13.58$) - $t(76) = 2.48$, $p < 0.05$, meaning the PCN group was significantly older.

The different quality of life parameters (according to EQ-5D-5L questionnaire) were compared between the groups of RUC and PCN (Figure 2). There was no statistically significant difference between groups regarding '*problems in walking*' ($p=0.29$), '*problems performing usual activities*' ($p=0.78$), '*pain and discomfort*' ($p=0.19$) and '*anxiety and depression symptoms*' ($p=0.42$). Although there was no statistically significant difference, PCN groups reported higher percentage of problems in all parameters. Moreover, more than 50% of patients in both groups reported developing problems in '*usual activities*', '*pain/discomfort*' and '*anxiety/depression*' (Figure 2). On the other hand, there was a statistically significant difference in terms of '*problems in dressing autonomously*' ($p<0.05$), in which the group of patients undergoing PCN showed a higher number of patients reporting development of difficulties (36.1%). Annex 3 shows a deeper view into the specific percentages that each level (slight, moderate, severe, extreme/unable) scored, in each group.

Finally, there was a significant difference in EQ-VAS scores ($p<0.05$) for PCN ($M=58 \pm 20.6$) and RUC groups ($M=70 \pm 1.6$), meaning that PCN group rated a significantly lower global quality of life perception score.

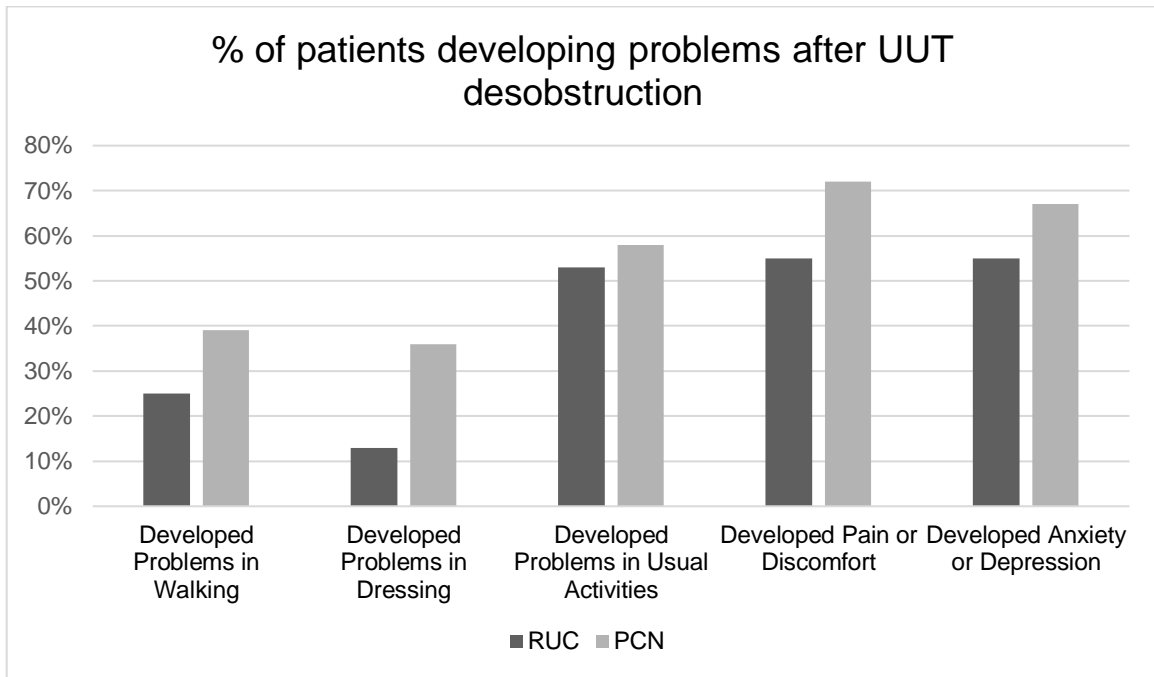


Figure 2- Percentage of patients reporting development of problems after UUT desobstruction

Discussion

Upper urinary tract (UUT) obstruction can lead to loss of renal function or even endanger the life of the patient, when hydronephrosis is complicated by infection. Surgical decompression of the kidney in patients with obstructive pyelonephritis has been shown to be associated with a reduction in mortality. One study showed that patients who did not undergo decompression were 2.6 times more likely to die during their hospitalization.(17) Although the ideal method of decompression is not determined, it should be easily applicable, have complete success, have few complications, and not affect the QOL of patients. The change in patients' quality of life after the procedure is of profound importance and should be part of the decision-making process. When the clinical scenario indicates that both procedures are equally adequate, the expected QoL must be a key determinant in the decision. Our work aim was met, and it is possible to draw some conclusions that we believe will contribute to what is a current debate among urologists in Portugal and worldwide.

Our results showed consensus and clear agreements in UUT decompression indications, timing of decompression and the preferred method of desobstruction, however, it is of major importance to compare the results obtained with previously developed studies.

A similar British survey conducted in 2008 by Lynch, reported that patients with UUTO and fever, together with elevated inflammatory parameters, would have an indication to perform non-urgent RUC or PCN, with broad agreement indicating that PCN was preferable. (4) In our work, the conclusions were similar, with a clear agreement for decompression in these clinical settings, but a broad agreement that both techniques would be equally adequate. In the case of obstruction and signs of sepsis, clear agreement exists for decompression, and that it should be done in less than an hour, but again it was considered that both techniques are equally suitable. On contrary, Lynch report that PCN is the best clearance technique in these cases.

In the presence of AKI, consensus exists regarding the need for desobstruction, which should take place between 3-12h. Comparable results have been reported by Lynch, which concluded that it can even be delayed until the next day if clinically feasible.

When questioned about the CRP values that should motivate UUT clearance in the absence of other clinical or laboratory signs, the answers showed a heterogeneous distribution. However, there was clear agreement between Portuguese urologists that no decompression procedure should be performed with CRP values under 5mg/dl.

Regarding cases of UUTO caused by stones refractory to MET, there is a broad agreement indicating necessity for desobstruction, which may be deferred to the following day, and that there may even be an indication to perform primary URS.

The necessity for clearance in cases of UUTO and a single functioning kidney was also a consensual in the Portuguese reality, with broad agreement that it should be promptly performed (first 1-3h).

Our study didn't reach consensus in UUT decompression during pregnancy. Previous studies have shown that pregnant women with stone disease may undergo definitive treatment with ureteroscopy in specialized referral centres. (4) Khoo argued that if the expertise exists, and if the patient is stable, primary URS is indicated. Lynch and colleagues indicate that around 40% of both radiologists and urologists' favour PCN in this setting with 60% of urologists and 17% of radiologists favouring RUS. (4)

In cases of locally advanced neoplasia, it was possible to conclude that a clear agreement towards PCN exists. However, there is still debate regarding decompression of malignant ureteric obstruction, with conflicting results in previous studies.

It has become clear that primary URS represents an option for clearance of stones refractory to MET and when AKI is present. Although, there is clear consensus not to perform primary URS with fever, signs of sepsis or elevated inflammatory parameters. Our results question the recent studies that suggest URS can effectively and safely manage febrile hydronephrosis when combined with strong antibiotics.

To our knowledge, this study was pioneer in surveying expert opinion on the remaining parameters that were not compared during this discussion. These findings are summarized in the conclusion. Our results will probably be endorsed with future studies that will corroborate the indications we propose.

UUTO is a common condition that affects a patient's QoL in a variety of ways. Conflicting evidence exists regarding QoL in patients with PCN and RUC.

In our study, patients with PCN reported a worse QoL according to EQ-VAS scale. This finding may be biased by an older population with more comorbidities and the retrospective single time assessment of this scale.

In terms of EQ-5D-5L parameters, we concluded that the impact is similar between both procedures. Although a higher number of PCN patients reported development or worsening of symptoms concerning the evaluated parameters, this difference was not significant. Therefore, the premise that RUC is the method that most preserves QoL cannot be reached. Patients carrying PCN reported more problems dressing autonomously. This difference may be attributed to PCN external device and bag, which prevents the patients from confidently dressing and washing autonomously. In general, our results are similar to the ones obtained by Shvero and colleagues, where EQ-5D-5L was applied to patients who had undergone PCN or RUC due to malignant urinary obstruction. The quality of life was examined and no difference in the specific quality of life measurement was noted. (13)

A study carried out with the same questionnaire revealed that PCN patients suffered mostly from discomfort involving '*movement*', '*self-care*' and '*personal hygiene*' in the first month. However, over time, PCN patients improved their symptoms, while RUC patients worsened or maintained symptoms. In this study, the number of PCN patients reporting pain remained similar over time, and analgesic use even lowered. While patients in the RUC group reported more pain,

and analgesics use grew in prevalence and frequency. A higher number of RUC patients also reported development of anxiety or depressed mood compared to PCN patients.(7)

To summarize, our data analysis indicated that RUC and PCN have a negative similar effect on the various domains of QoL. Two limitations in QoL survey were the retrospective design and that controls were recruited by convenience sampling. In future studies, we aim to evaluate quality of life in a prospective design, applying the questionnaire before and after de procedure. We also aim to evaluate the lower-tract symptoms that may be more evident in patients who underwent RUC (13).

We also want to amplify our survey respondents by increasing the number of Portuguese participants and expand to European consensus via EAU, YAU and ESRU. Our last aim is to assemble Portuguese experts in the next Portuguese Urology Association meeting to define the expert-based consensus national guidelines for UUT decompression.

Conclusion

Indications for Upper urinary tract decompression:

Specialists Clearly Agree	<ul style="list-style-type: none">• Fever (>38°)• Signs of sepsis• AKI• AKI with complications• Leucocytosis and/or high CRP• Single functioning kidney
Specialists Clearly Agree	<ul style="list-style-type: none">• Decompression in <3h with sepsis• Decompression in 1-3h with AKI with complications
Specialists Broadly Agree	<ul style="list-style-type: none">• Refractory to MET• Appropriate to wait 3 or more weeks until decompression

Indications for PCN in Upper urinary tract decompression:

Specialists Clearly Agree	<ul style="list-style-type: none">• Advanced oncologic disease
Specialists Broadly Agree	<ul style="list-style-type: none">• Blood clots• Renal abscess• Pyonephrosis• Adenopathic conglomerates

Indications for RUC in Upper urinary tract decompression:

Specialists Clearly Agree	<ul style="list-style-type: none">• Coagulation alterations• Antiaggregant therapy• Anticoagulant therapy• Slight hydronephrosis• Ureteric calculus <5mm• Obese Patient• Preserving the quality of life
Specialists Broadly Agree	<ul style="list-style-type: none">• Ureteric calculus 5-10 mm• Young patient

Indications for Primary URS in Upper urinary tract decompression:

Specialists Clearly Agree	Do not perform URS with: <ul style="list-style-type: none">• Fever (>38°C)• Sepsis• Increased inflammatory parameters
Specialists Broadly Agree	<ul style="list-style-type: none">• Lithiasis refractory to MET• AKI

Acknowledgments

I would like to thank Professor Arnaldo Figueiredo and Dr. Vasco Quaresma, who represented a fundamental pillar in the development of this thesis. I would also like to thank my parents and brother, grandparents, and friends, with a special mention for my grandfather, who, from an early age, cultivated my interest in the Urology field.

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ANNEX 1 - Ureteric catheter vs nephrostomy in upper urinary tract clearance: national consensus

PROJETO DE INVESTIGAÇÃO ACADÉMICO

Catéter uretérico vs nefrostomia na desobstrução do trato urinário superior: consenso nacional e avaliação da qualidade de vida

INFORMAÇÃO GERAL E OBJECTIVOS DO ESTUDO:

Caro/a participante,

É convidado a participar voluntariamente neste estudo por ser especialista ou interno de Urologia e desenvolver a sua atividade em Portugal. Trata-se de um estudo a decorrer no âmbito de uma dissertação de Mestrado em Medicina da Faculdade de Medicina da Universidade de Coimbra, que pretende avaliar qual o melhor método de desobstrução do trato urinário superior perante diferentes situações clínicas, tendo por base a opinião de especialistas portugueses.

Para tal, solicitamos a sua colaboração através do preenchimento de um questionário (cerca de 5-7 minutos). A sua participação é voluntária e poderá desistir a qualquer momento, se assim o entender. Todos os dados serão recolhidos e armazenados de forma anónima, são confidenciais, acedidos apenas pelos investigadores, e exclusivamente para fins de investigação, sendo que os participantes não poderão ser identificados.

Caso pretenda algum esclarecimento sobre este estudo ou esteja interessado/a em saber os seus resultados, poderá contactar a equipa de investigação através do e-mail: vpdquaresma@gmail.com

Se deseja participar neste estudo, seleccione a opção abaixo indicada para declarar o seu consentimento, prossiga para o preenchimento dos questionários.

Obrigada pela sua disponibilidade e colaboração!

CONSENTIMENTO INFORMADO

Declaro que li atentamente e compreendi a informação do Consentimento Informado. Compreendo que a participação neste estudo é voluntária e anónima. Compreendo que os dados recolhidos serão analisados apenas para fins de investigação e que não é possível qualquer identificação pessoal. Concordo com as condições e desejo participar neste estudo voluntariamente.

DADOS RELATIVOS AO CLÍNICO:

1. Unidade de trabalho (pode escolher mais do que uma)

- Hospital Universitário
- Hospital Central
- IPO
- Hospital Distrital
- Hospital Privado

2. Carreira médica

- Assistente Graduado Sênior
- Assistente Graduado
- Assistente
- Interno de Formação específica

3. Experiência clínica

- >20 anos
- 10-20 anos
- 6-10 anos
- 3-6 anos
- <3 anos

4. Desempenha atualmente atividade assistencial no serviço de urgência

- Sim
- Não

5. Realiza colocação de nefrostomias percutâneas na sua prática clínica

- Sim
- Não
- Não, realizada pele radiologia de intervenção na minha unidade de saúde

6. Realiza colocação de cateter duplo J na sua prática clínica

- Sim
- Não

DADOS RELATIVOS À UNIDADE DE SAÚDE/RECURSOS DISPONÍVEIS:

1. **Número de casos diários em situação de necessidade de desobstrução do trato urinário alto**
 - 1 caso dia
 - 2-3 casos dia
 - 3-5 casos dia
 - >5 casos dia

2. **Existência de Urologia 24h na sua unidade de saúde**
 - Sim
 - Não

3. **A sua unidade de saúde é centro de referenciação de urgência de urologia**
 - Sim
 - Não

4. **Existência de Radiologia de intervenção na sua unidade de saúde**
 - Sim
 - Não

5. **Relativamente à colocação de cateter de Nefrostomia percutânea, assinale o(os) recurso(s) que lhe são disponibilizados:**
 - Ecografia
 - Fluoroscopia
 - Sala no bloco operatório central
 - Sala no departamento de urgência
 - Anestesia Geral/Anestesista
 - Anestesia Local
 - Outros: _____

6. **Relativamente à colocação de cateter de duplo J, assinale o(os) recurso(s) que lhe são disponibilizados:**
 - Fluoroscopia
 - Sala no bloco operatório central
 - Sala no departamento de urgência
 - Anestesia Geral/Anestesista
 - Anestesia Local
 - Ureterorenoscopia
 - Outros: _____

CENÁRIOS CLÍNICOS DE DESOBSTRUÇÃO DO TRATO URINÁRIO SUPERIOR (TUS)

De seguida será confrontado com cenários práticos de desobstrução do trato urinário superior, pelo que deverá optar criticamente pela opção que considera mais apropriada de um ponto de vista clínico e não de adequação à realidade do seu hospital.

Relativamente aos critérios para desobstrução do trato urinário superior:

1. Nos seguintes cenários clínicos considere que está perante uma obstrução confirmada do trato urinário superior. Em que situações clínicas considera necessária a desobstrução do TUS. Nos cenários clínicos que procederia a desobstrução, classifique como emergente, urgente ou possibilidade de diferido (no dia seguinte).

- a. Obstrução + Febre ($\geq 38^{\circ}\text{C}$)

————— ————— ————— —————

Concordo Totalmente Concordo Sem opinião Discordo Discordo Totalmente

- Urgente
- Emergente
- Diferido

- b. Obstrução + Sinais de Sepsis

————— ————— ————— —————

Concordo Totalmente Concordo Sem opinião Discordo Discordo Totalmente

- Urgente
- Emergente
- Diferido

- c. Obstrução + Critérios de Lesão Renal Aguda

————— ————— ————— —————

Concordo Totalmente Concordo Sem opinião Discordo Discordo Totalmente

- Urgente
- Emergente
- Diferido

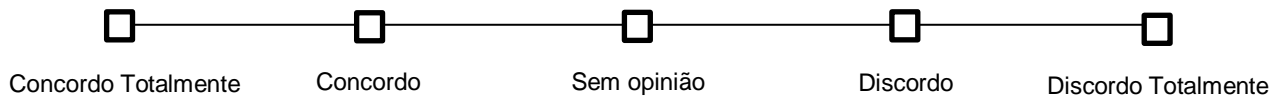
- d. Obstrução + Critérios de Lesão Renal Aguda com alterações ionograma (p.e. hiperK)

————— ————— ————— —————

Concordo Totalmente Concordo Sem opinião Discordo Discordo Totalmente

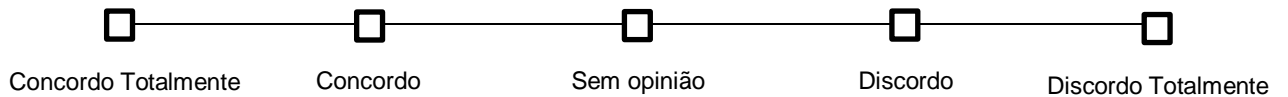
- Urgente
- Emergente
- Diferido

e. Obstrução + Leucocitose, sem aumento de PCR



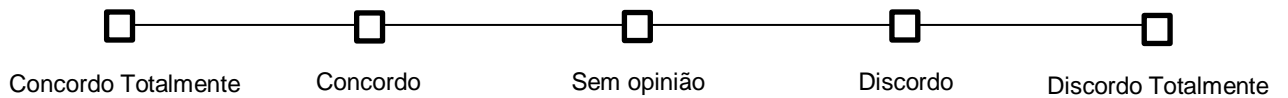
- Urgente
- Emergente
- Diferido

f. Obstrução + Leucocitose e aumento de PCR



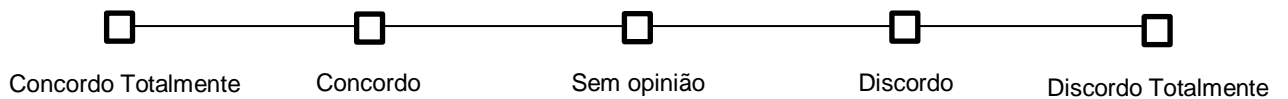
- Urgente
- Emergente
- Diferido

g. Obstrução refratária a terapêutica médica expulsiva



- Urgente
- Emergente
- Diferido

h. Obstrução em rim único (funcionante ou anatómico)



- Urgente
- Emergente
- Diferido

2. Qual considera ser o valor de proteína C reactiva (PCR) que deve motivar uma desobstrução do trato urinário superior na ausência de outros sinais clínicos ou laboratoriais? (valores de referencia normais: <0,5mg/dL ou 5mg/L)

- >0,5 mg/dL ou 5g/L
- >3mg/dL ou >30g/L
- >5 mg/dL ou >50g/L
- >7 mg/dL ou >70g/L
- >10 mg/dL ou >100g/L
- >15 mg/dL ou >150g/L

Relativamente à escolha do melhor método de desobstrução do trato urinário superior, considerando cenário clínicos:

1. Nos seguintes cenários clínicos considere que está perante uma obstrução confirmada do trato urinário superior e que decide proceder a desobstrução. Escolha o que considera ser o melhor método de desobstrução ou que escolheria como preferencial nos seguintes cenários clínicos:

Geral				
	Nefrostomia Percutânea	Cateter Uretérico	Igualmente adequado	Não tenho opinião
Febre ($\geq 38^{\circ}\text{C}$)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sinais de Sepsis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Choque Séptico	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Coagulopatia (INR $>1,5$ ou Plaquetas <40.000)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Toma de Antiagregantes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Toma anticoagulantes (NOAC/varfarina)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hidronefrose ligeira ($<12\text{mm}$)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gravidez	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Litíase urinária				
	Nefrostomia Percutânea	Cateter Uretérico	Igualmente adequado	Não tenho opinião
Cálculo uretérico $<5\text{mm}$	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cálculo uretérico 5-10mm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cálculo uretérico $>10\text{mm}$	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Steinstrasse</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Doença Oncológica

	Nefrostomia Percutânea	Cateter Uretérico	Igualmente adequado	Não tenho opinião
Neoplasia pélvica localmente avançada	0	0	0	0
Massa pélvica volumosa	0	0	0	0
Conglomerados adenopáticos	0	0	0	0
Doença metastática	0	0	0	0
Neoplasia do urotélio alto	0	0	0	0

Intraoperatório/pós-operatório

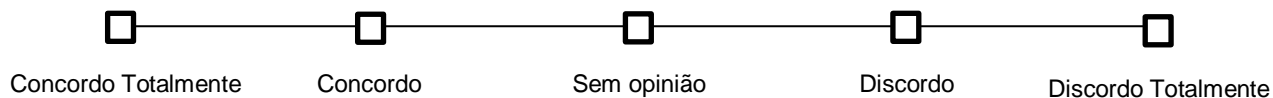
	Nefrostomia Percutânea	Cateter Uretérico	Igualmente adequado	Não tenho opinião
Fístula urinária Nefrectomia Parcial	0	0	0	0
Ressecção meato uretérico em RTU	0	0	0	0
Fístula ureter iatrogénica	0	0	0	0

Relativamente à escolha do melhor método de desobstrução do trato urinário superior, considerando características do doente que podem condicionar a decisão perante a mesma indicação clínica:

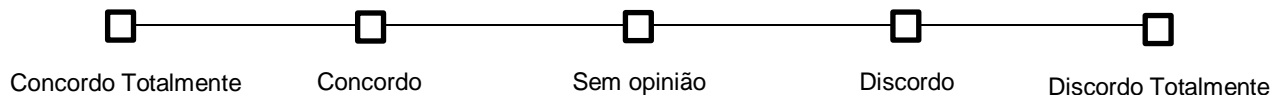
	Nefrostomia Percutânea	Cateter Uretérico	Igualmente adequado	Não tenho opinião
Homem	0	0	0	0
Mulher	0	0	0	0
Jovem ou adulto	0	0	0	0
Idade avançada	0	0	0	0
Atividade laboral mantida	0	0	0	0
Cuidados paliativos	0	0	0	0
Dependente nas AVDs	0	0	0	0
Doente da área de residência	0	0	0	0
Doente fora da área de residência	0	0	0	0

Relativamente à desobstrução do trato urinário superior por litíase uretérica, perante os seguintes cenários clínicos, concorda com a desobstrução com Ureterorenoscopia (URS) Primária com ureterolitoextração ou litotricia;

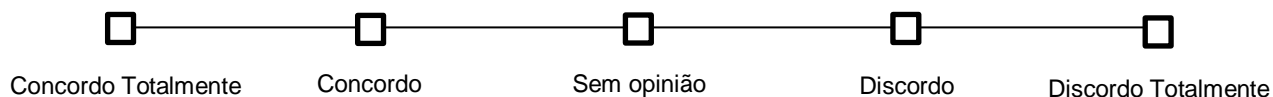
Procederia a URS Primária em doente com litíase uretérica e Febre (>38°)



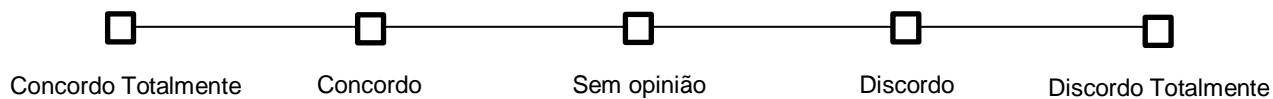
Procederia a URS Primária em doente com litíase uretérica e sépsis (mais do que um critério de SIRS) com foco urinário



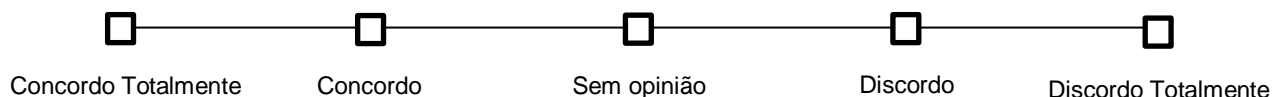
Procederia a URS Primária em doente com litíase uretérica e Lesão Renal Aguda (aumento da Cr sérica >50% em 48h ou diurese < 0.5ml/Kg/h por >6h)



Procederia a URS Primária em doente com litíase uretérica refratária à terapêutica médica expulsiva (TME)



Procederia a URS Primária em doente litíase uretérica e aumento dos parâmetros inflamatórios (PCR ou Procalcitonina)



ANNEX 2- Quality of life assessment

PROJETO DE INVESTIGAÇÃO ACADÉMICO

Catéter uretérico vs nefrostomia na desobstrução do trato urinário superior: consenso nacional e avaliação da qualidade de vida

INFORMAÇÃO GERAL E OBJECTIVOS DO ESTUDO:

Caro/a participante,

É convidado a participar voluntariamente neste estudo porque é portador de cateter de nefrostomia ou cateter de duplo J e tem mais de 18 anos de idade. Trata-se de um estudo observacional transversal, a decorrer no âmbito de uma dissertação de Mestrado em Medicina da Faculdade de Medicina da Universidade de Coimbra, que pretende avaliar qual o melhor método de desobstrução do trato urinário superior perante diferentes situações clínicas e definir as diferenças de qualidade de vida entre os dois métodos.

Para tal, solicitamos a sua colaboração através do preenchimento de um questionário (cerca de 5 minutos) e a resposta simples a dados clínicos e demográficos. A sua participação é voluntária e poderá desistir a qualquer momento, se assim o entender. Todos os dados serão recolhidos e armazenados de forma anónima, são confidenciais, acedidos apenas pelos investigadores, e exclusivamente para fins de investigação, sendo que os participantes não poderão ser identificados.

Caso pretenda algum esclarecimento sobre este estudo ou esteja interessado/a em saber os seus resultados, poderá contactar a equipa de investigação através do e-mail: mfranciscacspmagalhaes@gmail.com

Se deseja participar neste estudo, selecione a opção abaixo indicada para declarar o seu consentimento, prossiga para o preenchimento dos questionários e assine o consentimento informado anexado.

Obrigada pela sua disponibilidade e colaboração!

CONSENTIMENTO INFORMADO

Declaro que li atentamente e compreendi a informação do Consentimento Informado. Compreendo que a participação neste estudo é voluntária e anónima. Compreendo que os dados recolhidos serão analisados apenas para fins de investigação e que não é possível qualquer identificação pessoal. Concordo com as condições e desejo participar neste estudo voluntariamente.

DADOS SOCIODEMOGRÁFICOS E CLÍNICOS:

1. Idade: _____

2. Sexo: _____

3. Situação Laboral:

3.1 Está Empregado: Sim Não Se sim, qual? _____

3.2 Está a trabalhar neste momento: Sim ___ Não ___

Dados a preencher pelo investigador:

4. Motivo de desobstrução: _____

5. Método de desobstrução: Nefrostomia Cateter Duplo J

6. Data do procedimento: ___/___/___

7. Data do atual: ___/___/___

8. ECOG: ___

9. Comorbilidades: _____

QUESTIONÁRIO EQ-5D-5L
Questionário de Saúde - Versão Portuguesa

APRESENTAÇÃO DO QUESTIONÁRIO EQ-5D

Estamos a tentar averiguar o que pensa da sua saúde.
Seguem-se algumas perguntas simples sobre a sua saúde HOJE. Deve solicitar ajuda sempre que não compreenda alguma coisa ou se alguma coisa não lhe parecer clara. Lembre-se também que não existem respostas certas ou erradas. Estamos apenas interessados na sua opinião pessoal.

EQ-5D SISTEMA DESCRITIVO:

INTRODUÇÃO

- ✓ Cada pergunta tem cinco opções de resposta.

Assinale, por favor, qual a resposta que melhor descreve a sua saúde HOJE. Não escolha mais do que uma resposta em cada grupo de perguntas:

EQ-5D – SISTEMA DESCRITIVO MOBILIDADE

Relativamente à sua mobilidade, diria que:

- | | |
|---|--------------------------|
| Não desenvolvi problemas em andar | <input type="checkbox"/> |
| Desenvolvi problemas ligeiros em andar | <input type="checkbox"/> |
| Desenvolvi problemas moderados em andar | <input type="checkbox"/> |
| Desenvolvi problemas graves em andar | <input type="checkbox"/> |
| Fiquei incapacitado/a de andar | <input type="checkbox"/> |

CUIDADOS PESSOAIS

Em seguida, seguem-se algumas perguntas sobre cuidados pessoais. Diria que:

- | | |
|---|--------------------------|
| Não desenvolvi problemas em lavar-me ou vestir-me | <input type="checkbox"/> |
| Desenvolvi problemas ligeiros em lavar-me ou vestir-me | <input type="checkbox"/> |
| Desenvolvi problemas moderados em lavar-me ou vestir-me | <input type="checkbox"/> |
| Desenvolvi problemas graves em lavar-me ou vestir-me | <input type="checkbox"/> |
| Fiquei incapacitado/a de me lavar ou vestir sozinho/a | <input type="checkbox"/> |

ATIVIDADES HABITUAIS

Seguem-se algumas perguntas sobre atividades habituais, por exemplo, trabalho, estudos, atividades domésticas ou atividades em família ou de lazer.

Diria que:

- | | |
|---|--------------------------|
| Não desenvolvi problemas em desempenhar as minhas atividades habituais | <input type="checkbox"/> |
| Desenvolvi problemas ligeiros em desempenhar as minhas atividades habituais | <input type="checkbox"/> |
| Desenvolvi problemas moderados em desempenhar as minhas atividades habituais? | <input type="checkbox"/> |
| Desenvolvi problemas graves em desempenhar as minhas atividades habituais | <input type="checkbox"/> |
| Fiquei incapacitado/a de desempenhar as minhas atividades habituais | <input type="checkbox"/> |

DOR / MAL-ESTAR

Em seguida, seguem-se algumas perguntas sobre dores ou mal-estar. Diria que:

- | | |
|---|--------------------------|
| Não desenvolvi dores ou mal-estar | <input type="checkbox"/> |
| Desenvolvi dores ou mal-estar ligeiros | <input type="checkbox"/> |
| Desenvolvi dores ou mal-estar moderados | <input type="checkbox"/> |
| Desenvolvi dores ou mal-estar graves | <input type="checkbox"/> |
| Desenvolvi dores ou mal-estar extremos | <input type="checkbox"/> |

ANSIEDADE / DEPRESSÃO

Para terminar, seguem-se algumas perguntas sobre ansiedade ou depressão. Diria que:

- Não fiquei ansioso/a ou deprimido/a
- Tornei-me ligeiramente ansioso/a ou deprimido/a
- Tornei-me moderadamente ansioso/a ou deprimido/a
- Tornei-me gravemente ansioso/a ou deprimido/a
- Tornei-me extremamente ansioso/a ou deprimido/a

Agora, gostaria de lhe perguntar o quanto a sua saúde está boa ou má **HOJE**.

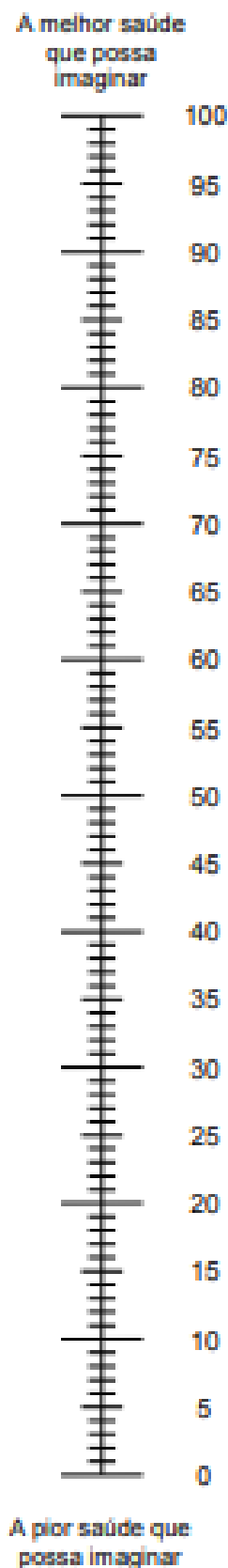
Vou pedir-lhe para observar a escala que se segue, parecida com um termómetro. É capaz?

A melhor saúde que consegue imaginar está marcada com 100 (cem) no cimo da escala e a pior saúde que consegue imaginar está marcada com 0 (zero) no fundo da escala.

Agora, vou pedir-lhe para escrever em que ponto desta escala colocaria a sua saúde hoje.

A SAÚDE DO ENTREVISTADO HOJE:

Obrigado pelo tempo que dispensou a responder a estas perguntas



ANNEX 3- Percentages that each level (slight, moderate, severe, extreme/unable) scored, in each group

	Mobility N(%)		Self-Care N(%)		Usual Activities N(%)		Pain/Discomfort N(%)		Anxiety/Depression N(%)	
	RUC	PCN	RUC	PCN	RUC	PCN	RUC	PCN	RUC	PCN
Level 1 (No Problems)	30 (75%)	22 (61.1%)	35 (87.5%)	23 (63.9%)	19 (47.5%)	15 (42%)	18 (45%)	10 (28%)	18 (45%)	12 (33%)
Level 2 (Slight problems)	3(7.5%)	7 (19.4%)	3 (7.5%)	5 (13.9%)	10 (25%)	8 (22%)	8 (20%)	15 (42%)	12 (30%)	9 (25%)
Level 3 (Moderate Problems)	5(12.5%)	3 (8.3%)	1 (2.5%)	4 (11.1%)	8 (20%)	9 (25%)	9 (23%)	9 (25%)	5 (12.5%)	10 (28%)
Level 4 (Severe Problems)	1(2.5%)	4 (11.1%)	1 (2.5%)	2 (5.6%)	2 (5%)	3 (8%)	5 (13%)	2 (6%)	5 (12.5%)	4 (11%)
Level 5 (Unable to do)	1 (2.5%)	-	-	2 (5.6%)	1 (2.5%)	1 (3%)	-	-	-	1 (3%)

Annex 3- “ Percentages that each level (slight, moderate, severe, extreme/unable) scored, in each group”