Malignant Ureteric Obstruction Decompression: How much gain for how much pain? A systematic review of the literature.

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Abstract

Background:

Over the last thirty years, the management of Malignant Ureteric Obstruction (MUO) has evolved from a single disciplinary decision to a multi-disciplinary approach. Careful consideration must be given to the risks and benefits of decompression of hydronephrosis for an individual patient. Though there is some recommendations within cancer specific guidelines, both the European Association of Urology and the American Urological Association guidelines recommend drainage or de-obstructing the urinary systems. there is a lack of consensus of opinion as well as strong evidence to support the decision process.

Methodology:

The review was conducted using Cochrane and PRISMA guidelines. Outcomes that were identified amongst patients undergoing treatment for MUO included prognosis, quality of life (QOL), complications, morbidity and prognostication tools.

Results:

A total of 57 papers were included. Median survival was 6.8 months in the 50 papers that stated this outcome. The average reported complication rate was 41% with one fifth of patients never leaving hospital post procedure. Significant predictors to poor outcomes included low serum albumin, hyponatremia, the number of malignancy related events, and performance status of 2 or worse on the European cooperative cancer group. For those patients with 2 or more risk factors, median survival ranged from 1.7–2.6 months and 12-month survival ranged from 0%-12%. QOL using several measures ranged from 41–88%.

Conclusion:

In this post Montgomery era with the concept of the ‘reasonable patient’, can we continue to justify discussing decompression without stating the evidence-based risks from the emergent body of literature? We propose a multi-centre

review of outcomes to enable evidence-based consultations for patients and their families.

Introduction

Malignant ureteric obstruction (MUO) is a condition that affects patients with advanced stages of cancer. It can be attributed to urological and non-urological malignancies (gynecological, colorectal, haematological and retroperitoneal). An obstructed single system can significantly reduce patients' quality of life of patients especially if infection ensues, however, bilateral obstruction will lead to a certain death. In fact upper urinary tract obstruction is a prognostic indicator of morbidity for many cancers (1–3).

MUO management is usually a straightforward decision, with relief of obstruction causing significant improvements in the infected urinary tract, relief of pain and/or renal failure. However, the procedure and the nephrostomy tubes left in situ are not without complications, and therefore, the decision is more difficult to take in the palliative setting, as it can leave the patient burdened with more symptoms and complications with the often short time they have left.

With a life-threatening obstruction the decision to decompress should be weighed against the prognosis of the patient's condition, in addition to taking into account associated patient comorbidities, the need for further regular interventions, reduced quality of life from the nephrostomy or stent, and most importantly the patient's preferences.

Over the last thirty years, the management has evolved from a single disciplinary decision to a multi-disciplinary approach involving Urologists, Oncologists, Palliative care physicians, General Medicine physicians and Interventional Radiologists. This is mainly due to the fact that advanced stages of cancer is now treated with this multi-disciplinary approach, in addition the surgical approach to MUO has evolved from predominantly highly morbid open surgical procedures(4) to minimally invasive techniques (5). Brin *et al*. in 1975 described their 'disappointing' experiences of open palliative procedures with patients suffering 'an inexorable downhill course'(6). Interestingly, oncologists are more likely to push for decompression in asymptomatic patients with a poor prognosis than urologists (7). Nevertheless, early support and advice from palliative and general medical physicians can significantly help alleviate suffering whichever decision is made.

Individualized consideration must be given to the risks and benefits of decompression (6,8–12). Though there are recommendations within cancer specific guidelines, both the European Association of Urology (EAU) and the American Urological Association (AUA) guidelines recommend decompressing the urinary systems (16,17, 18, 19), there is a lack of consensus of opinion as well as strong evidence to support the decision process (2,4, 16, 17). The National institute for health care excellence (NICE) guidelines concluded that patients should be offered decompression, but that the option of 'no intervention should also be discussed.' They noted that there was insufficient low grade evidence in this arena (16, 17). None of these recommendations take into consideration the implications of quality of life.

To this end, we aimed to conduct a review of the literature to be able to inform the decision making process of managing patients with MUO. Specifically, we aim to distill the relevant evidence in this paper to help facilitate an evidence-based consultation with patients and their families on prognostic outcomes of decompression in the setting of malignant ureteric obstruction (15).

Methods

Search strategy:
The review was conducted using Cochrane and PRISMA guidelines (16–18). The search strategy included the following databases: The US National Library of Medicine's life science database (MEDLINE) (1975- September 2017), EMBASE (1975- September 2017), Cochrane Central Register of Controlled Trials - CENTRAL (in The Cochrane Library - 2017), CINAHL (1975- September 2017), Clinicaltrials.gov, Google Scholar and Individual urological journals.

Search terms used included: "malignant ureteric obstruction", "percutaneous nephrostomy", "stent", "quality of life" and "prognosis".
Medical Subject Headings (MeSH) phrases included:

- (("Stents"[Mesh]) AND "Neoplasms"[Mesh]) AND "Quality of Life"[Mesh]
- (((("Stents"[Mesh]) AND "Ureter"[Mesh]) AND "Neoplasms"[Mesh]) AND "Quality of Life"[Mesh]
- ((("Stents"[Mesh]) AND "Ureteral Obstruction"[Mesh]) AND "Neoplasms"[Mesh]) AND "Quality of Life"[Mesh]
- ((("Stents"[Mesh]) AND "Ureteral Obstruction"[Mesh]) AND "Neoplasms"[Mesh]) AND "Prognosis"[Mesh]
- (("Nephrostomy, Percutaneous"[Mesh]) AND "Neoplasms"[Mesh]) AND "Quality of Life"[Mesh]
- ((("Nephrostomy, Percutaneous"[Mesh]) AND "Ureteral Obstruction"[Mesh]) AND "Neoplasms"[Mesh]) AND "Prognosis"[Mesh]
- ((("Nephrostomy, Percutaneous"[Mesh]) AND "Ureteral Obstruction"[Mesh]) **AND "Neoplasms"[Mesh]) AND "Quality of Life"[Mesh]**

Study selection:

Three authors (JP, TA, and OA) independently completed the review of literature independently and followed predefined inclusion criteria. Disagreement between the authors in study inclusion was resolved by consensus.

Inclusion criteria

All types of publications were included. Manuscripts involving adult patients (18 years old and above) with malignant ureteric obstruction in the English language were included. If only abstracts were available, these were included if sufficient data were extractable. We included papers reporting on benign disease if the data could be extracted separately.

Our outcome measures were:

1) Prognosis in patients diagnosed with malignant ureteric obstruction (across all tumour groups) who received decompression via PCN or ureteric stenting
2) Quality of life associated with the above
3) Major and minor complications
4) Morbidity defined as hospitalisation post-intervention
5) Effect of decompression on renal function
6) Prognostication tools in use to predict poor outcomes from intervention

Data Extraction

Data of each included study was independently extracted initially by 2 authors (JP and TA) after which a senior author (OA) extracted the data independently and cross checked each data extraction to ensure quality assurance of data.

The following variables were extracted from each study: Number of patients, gender, intervention, age, primary diagnosis, median survival, complications, amount of time spent in hospital, proportion of lifetime spent in hospital, proportion of patients not discharged, mortality, prognostication (where available) and quality of life.

Where applicable the data of each study was pooled into a meta-analysis, in an intention to treat basis, to give a numerical representation of the results

Results

The initial review yielded 169 papers. Of these 70 were excluded after abstract screening, 35 were later excluded after full manuscript review. Of the thirty-five papers excluded. Thirteen papers included benign causes, nine had no survival data, four used surgical diversion techniques and one paper excluded patients with poor outlook. Four were not available in the English language. Three authors were contacted to obtain manuscripts but did not respond. In total, 57 papers were included in the review.

Characteristics of included studies

Seventeen studies were from United States of America, 12 from the United Kingdom, 6 from Japan, 4 from Brazil, 2 from Greece, 2 from Germany and 2 from Korea. There was one paper authored from; Serbia, the Philippines, Singapore, China, Pakistan, Jordan, Turkey, Israel, Sweden, New Zealand, Australia and Austria.

Only 9 studies were prospective in nature; of these one was a Prospective cohort study. There were no randomised controlled trials. The follow up period ranged from 6 months to 8 years.

Demographics

In total, 4948 patients were included in this study (1,3,8–11,15,19–43,43–62). Of which, 1030 patients had stents and 3891 had nephrostomies. Most papers classified patients by individual tumour type (table 1) (1,3,8–11,15,19–43,43–63). The mean age of patients was 60 (range 19 – 97 years) (1,3,8–11,15,19–25,27,28,31,32,34–38,40–42,44,47–49,51–53,55–57,59,60,62,63).

Table 1: Distribution of cancers

Type of cancer	No of Patients included
Prostate	1561
Bladder	533
Colorectal	473
Gastrointestinal	300
Cervical	829
Uterine	64
Other	605

Prognosis

Fifty papers included prognosis as an outcome measure with a total of 2790 patients included. This ranged from 21 hours to 140 months with a median survival of 6.4 months (1,3,8–11,15,19–43,43–52,54,56–59,61–63).
Eight papers provided a mean one year survival; the aggregate mean of the percentage of patients surviving one year was 23% (3,9,10,23,24,28,32,38,44).

Quality of life

Twenty papers assessed quality of life with a total of 824 patients (9,11,12,19–22,24,27,30,32,44,45,48,49,60,61,64–66). Measures included time spent in hospital, pain assessment and qualitative interviews.

Five studies used the Grabstald outcome measure tool (167 patients), (19,20,49,61,65,67). A cumulative analysis of which, found that 60% of patients were able to achieve a 'useful life' post decompression. (table 2)

Table 2: Papers using Grabstald 'useful life measure'

Paper	Type	Date	Number and male/female average age	Tumour type	Stent/nephrostomy (n patients)	Gradstald percentage
Hubner *et al* .1993	Retrospective	1986-1989	52 (31 f, 21 m) 67 (43-81)	Prostate 7% Bladder 25% Colorectal 28% Cervix 17% Ovarian 11% Other 2%	Stent 24, PCN 28	81%
Hoe *et al.* 1993	Retrospective	Not stated	Not stated	Colorectal 33% Cervix 5% Prostate	PCN 24	46 %

				5% Bladder 5% Rest not stated.		
Emmert *et al.* 1997	Retrospective	1990-1995	24 Age 45.9 (30-79)	Cervical 100%	PCN 24	46 %
Feng *et al.* 1999	Retrospective	1984-1996	37 (20 f, 17 M) 37-85 no mean	Prostate 27% Bladder 13% Colorectal 10% Cervix 32% Uterus 5% Ovarian 10%	Stent 22, PCN 15	82-87% classified into two groups
Wilson *et al.* 2005	Retrospective	1996-2001	32 (16 male and 16 female) age 68.1 (42-84)	Prostate 28% Bladder 25% Colorectal 21% Cervix 15% Uterus 6% Breast 3%	PCN 32	46.9%

Two studies used the functional assessment of cancer therapy (FACT) concerning nephrostomy insertion or not and nephrostomy versus stent insertion. Neither had significant difference between the groups. One study used the European Organization for Research and Treatment of Cancer Quality of life questionnaire (EORTC- QOLC –C30)(60). There was no significant difference in quality of life when administered pre and post nephrostomy insertion (table 3) Aravantinos *et al.* used the European Organisation for Research and Treatment of Cancer Quality of life questionnaire (EORTC- QOLC –C30)(60). There was no significant difference in quality of life when administered pre and post nephrostomy insertion.

Table 3: Quality of life

Author	Patient details	Assessment	Outcome
Aravantinos *et al.* 2007	207 Bladder, Prostate, Cervical, Gynaecological	EORTC-QOLC –C30	No significant difference in quality of life when administered pre and post nephrostomy insertion.
Monsky *et al.* 2013	46 (13 lost to follow up) Bladder 14, cervical 15, Prostate 6, Uterine 5, Other 7 PCN = 15 Stent = 31	FACT-BL	No statistical differences in patients' responses post stenting or PCN insertion. Patients with stents reported significantly greater pain and storage lower urinary tract symptoms, although this did not translate into a reduction in measured quality of life (QOL).
Lapitan *et al*. 2011	Cervical cancer	FACT-G	There was no statistical difference in the FACT-G scores for patients with or without PCN
Bigum *et al.* 2015	10 (Prostate 8, Bladder cancer 2) All Nephrostomy	Qualitative interview	Main themes: Lack of follow up, complications, physical limitations and the impact on their social life
Kumar *et al.* 2015	17 patients All PCN Ovary 6, Uterine 3, Cervical 2	Qualitative interview	Main themes: Symptoms from decompression, an educational void and the role of self education (30% no symptoms

Complications

Twenty-four of the papers commented on the frequency of complications with a total of 1891 patients. The overall complication rate was 41% (10,11,15,21,22,25,31,32,35,38,44,50,58).

Minor complication

26% (439/1658) of patients with nephrostomies developed urinary infection whilst 14% (26/180) of patients with stents placed developed infections. 10%

(173/1658) patients experiencing dislodged nephrostomies whilst 7% (113/1658) of patients developed blocked nephrostomies. Stent migration/dislodgement was reported in 6% (10/180).

Major complications

Haematuria rate 8% (15/180) in patient's stented compared to 3% (49/1658) in patients with nephrostomies. Nephrectomy rate was 0.2% (4/1658) following PCN placement; 2 for perinephric abscess (the indication for the other two patients was not stated) (31,32). Mortality rate was 0.2% (4/1658); three from haemorrhage and one from sepsis. In the three papers who reported mortality the overall rate was 5% (4/82) (21,51,61).

Disease Mortality

Twelve papers (628 patients) calculated the proportion of patients who never left hospital post decompression (9,11,20–22,27,30,32,44,54,61,63) with the pooled mean for this being 26% (5-69%).

Patients spent 20% of their remaining lifetime in hospital (8,22,27,32,36,43,44,47,48,52,61,63).

Renal function

Twelve papers included renal function pre and post procedure (a total of 1135 patients). Pre nephrostomy, the average creatinine was 624 mmol/L and post procedure, the creatinine improved to 212 mmol/L on average (9,10,20,22,30,42,43,48,53,59,60,68).

Prognostication tools

Sixteen papers with a total of 2061 patients investigated various factors and their ability to prognosticate (3,9,10,23,24,27,29,30,35,37,41,53,60,69–71) in these patients.

These were found to include low serum albumin (10,29,35,41,71), no further treatment options(3,23,37,53), hyponatraemia (29,35), number of malignancy related events (pleural effusion, metastatic disease, ascites) (10,29,35,41), the presence of metastatic disease (27,60), performance status of 2 or worse on the European cooperative cancer group (ECOG) (9,23,53,71).

Patients with a malignancy of unknown primary or gastrointestinal origin were identified as having poorer outcomes (27,41) whereas gynaecological

malignancies had a better outcome(37). Other variables included patients with upper ureteric obstruction (23), moderate-severe hydronephrosis (24), bilateral hydronephrosis (41), elevated creatinine (24,37), anaemia (55) and patients with an elevated CRP(29)

Table 4: Summary of literature on Prognostication

Paper	Study type	N	Age (range)	Process	Tumour type (%)	Features of poor outcome (statistically significant)	Survival based on predictors
Feuer *et al.* 1991	Prospective	22	58 (n/a)	Univarate, Kaplain Meyer	Cervical 77 Gynaecological (other) 18 Uterine 4	Patients having one of: progressive tumour, Performance status >2, tumour related medical problems, no treatment, uncontrolled pain	<u>Survival</u> 242 days (if 0 factors) vs 37 days (if 1 or more factor) <u>Days at home</u> 164 days (if 0 factors) vs 37 days (if 1 or more factor)
Watkinson *et al.* 1993	Retrospective Case series	50	53	Grouping – no statistical analysis	Cervical 32 Bladder 36, Colon 10 Lymphoma 4, Ovary 4 Other 6	Not identified	<u>12 month survival</u> Group I - benign or treated (100%) Group II untreated malignancy (50%) Median survival 339 days Group III ureteric obstruction by abdominopelvic disease with treatment (50%) Median survival 334 days Group IV ureteric obstruction by abdominopelvic disease without treatment (0%) Median survival 38 days
Wong *et al.* 2007	Retrospective case series	102	62 (31-86)	Univariate and multivariate	Gastric 20 Gynaecological 31 Urological 29	Presence of metastatic disease Diagnosis of	<u>12 month survival</u> 63% in favourable (0-1 unfavourable factors) 12% in unfavourable

				analysis Kaplain Meyer	Other 18	MUO in presence established malignancy	(4 unfavourable factors)
Jeong *et al.* 2007	Retrospective case series	86	54 (23-79)	Univariate and multivariate analysis	Gastric 33, Cervical 10 Colorectal 40, Prostate 0, Bladder 0, Other 17	ECOG 2 or more Lesion in upper ureter No treatment options post nephrostomy	No prognostication tool suggested
Aravantinos *et al.* 2007	Retrospective	507	63 (40-85)	Kaplan-Meyer curves and Mann Whitney for QOL	Bladder 32 Prostate 26 Colorectal 17 Gynaecological 13 Other 8 gastric/pancreatic 3	Disseminated disease (significant for Prostate and Colorectal cancer only)	<u>All patients 6 month survival</u> 33% survival > 6 months
Ishioka *et al.* 2008	Prospective	140	57 (31-85)	Multivariate analysis Kaplain Meyer	Gastric 21, Cervical 21 Urothelial 9, Colorectal 24, Other 10	3 or more cancer related events Low serum albumin Low grade hydronephrosis	<u>6 month survival</u> 69% in favourable group (0 risk factors) Intermediate group 24% (1 risk factor) Poor group 2% (2-3 risk factors)
Lienert *et al.* 2009	Retrospective	49	71 (36-91)	Univariate	Cervical 6 Colorectal 12 Bladder 36, Prostate 30 Other 14	Three or more cancer related events Low serum albumin Low serum sodium	<u>Mean survival in months</u> 9 months for 0 risk factors 5.7 months for1 risk factor 2 months for 2 or 3 risk factors
Jalbani *et al.* 2010	Prospective	40	No average (21-70)	Paired T	Cervical 37 Rectum 7 Bladder 25, prostate 12 Rectum 7	None identified	<u>Good prognostic features</u> Recent diagnosis Age <52
Izumi *et al.* 2011	Retrospective	61	64 (27-89)	Univariate and multivariate analysis	Gastric 24 Cervical 26 Colorectal 12 ovarian 9 Bladder 3 Prostate 5	High creatinine (>106micromol/L) No treatment options Non gynaecological	<u>Survival in months</u> Good predictors 13.2 months Intermediate 8.2 months Poor 1.7 months

						cancer	
Migita *et al.* 2011	Retrospective	25	61	Multivariate analysis Kaplain Meyer	Gastric 100	No treatment options	Survival 3.1 Months if no treatment options 11.2 months if treatment options
Azuma *et al.* 2013	Retrospective	214	79% <80 21% >80	Multivariate	Gastric 16 Cervical 15 Colorectal 21 Urothelial 15 Prostate 14 Other 28	Number event related to malignant dissemination Low serum albumin Low serum sodium High CRP	Median survival 12 months Favourable (0-1 risk factors) 6 months Intermediate (2 risk factors) 2.6 months Poor group (3 risk factors)
Souza *et al.* 2016	Retrospective	48	59 (6-85)	Univariate Multivariate analysis	Cervical 100	Haemaglobin <8.7g/dL Haematocrit <27% Hypotension (in absence of sepsis)	Not calculated Compared characteristics of group that died compared with survival group
Alawneh *et al.*. 2016	Retrospective	211	59 (6-85)	Multivariate analysis Kaplain Meyer	Gastrointestinal 28 Genitourinary 58 Other 13	Presence of ascites, pleural effusion, Low serum albumin, Bilateral hydronephrosis Gastrointestinal malignancy	12 month survival 0 factors 78%, 1 factor 36% 2 factors 17%, 3 factors 6%
Cordeiro *et al.* 2016	Prospective	208	61 (19-89)	Multivariate analysis Kaplain Meyer	Cervical 20 Colorectal 21 Bladder 22 Prostate 12	Number malignant events > or equal to 4 ECOG > or = 2	12 month survival Favourable (0 factors) 45% Intermediate (1 factor) 15% Unfavourable (2 factors) 7%
Downey *et al.* 2016 (abstract only)	Retrospective	86	-	Grouping – no statistical analysis	Bladder 35 No further data	Not identified	12 month survival (Based on Watkinson *et al* 1993) Group I (non malignant) no data Group II (untreated primary) 20%, Group III (relapsed

							disease viable option) 16% Group IV (no treatment option) 0%
Gandiya *et al.* 2017 (abstract only)	Retrospective	193	70 (26-90)	Multivariate analysis Kaplain Meyer	Urological 47 gynaecological 22 Colorectal 11, other 20	Low serum albumin ECOG > or = 2 Prior oncological treatment	<u>Pooled survival</u> 82% survival at 1 month 63% at 3 months 50% survival at 6 months

Discussion

This review of 57 papers gives a broad survival range for patients with malignant ureteric obstruction; between 21 hours and 140 months (1,3,8–11,15,19–43,43–52,54,56–59,61–63). The median survival was 6.4 months and the percentage of patients alive at one year was 23% (3,9,10,23,24,28,32,38,44). Reasons for this variation in survival include the heterogeneous patient and cancer groups involved. Additionally, the data is limited by the fact that researchers in some instances may have included patients with retroperitoneal fibrosis secondary to treatment (such as radiotherapy) rather than ongoing or recurrent disease (72,73). The benign nature of this aetiology for obstruction would skew results towards improved outcomes. The majority of the papers reported on patients whom underwent decompression; therefore not capturing a proportion of patients who were not decompressed.

The proportion of patients whom had complications was 41% with 26% of patients never leaving hospital. Those who had an intervention spent 20% of their resultant lifetime in hospital. The placement of a stent or nephrostomy is morbid. In addition to this there is no improvement of quality of life; an often stated claim of decompression.

One paper stated that 69% of their patients never left hospital. Removing this apparent outlier from the pooled mean resulted in the figure of 17.8% (21).
Despite improving renal function creatinine did not return to base line for patients; potentially avoiding an emergency situation but not reversing the damage caused by hydronephrosis.

Two pertinent questions are always presented: what are the preferred options for relieving malignant ureteric obstruction? And; what is the expected prognosis (5)? In terms of methods of decompression; a previous comparative study discovered no relative superiority of retrograde stenting to percutaneous nephrostomy (PCN) in the setting of infected obstructed uropathy caused by stones (74). There are various options for managing malignant ureteric obstruction based on patient and oncological factors as well as clinical factors. This includes the specialty of the coordinating team and institutional factors such as the availability of interventional radiologists (7). Two recent review articles concluded that there was no data on the superiority of stent versus percutaneous nephrostomy +/- subsequent antegrade stent when considering malignant and benign ureteric obstruction (5,75). Cordeiro *et al*., Lang *et al.* and Wong *et al*. divided complications by intervention type, with 38%, 64% and 53% of patients respectively reporting complications with nephrostomies (9,27,58). The rate of complications for stents was 56% in Wong *et al*., 48% in Lang *et al.* series and 42% in the Cordeiro *et al* series(9,27). Wong however found that there was no statistically significant difference in the rate of complications between stents and nephrostomies (9,27,58).

Clearly, the aim of relieving the obstruction depends on patient factors but would include improving renal function to enable further oncological treatment, to correct the symptoms of renal failure and to improve pain (7). This must be balanced against a patient's expectation of quantity and quality of life. This is of course is a challenging consultation; particularly in the acute setting when such patients often present (69). Despite extensive retrospective publications and several review articles, there is a paucity of data assessing the important issues of quality of life and prognostication in this cohort of patients. (5). Historically, with regards to malignant ureteric obstruction; researchers equated quality of life with quantity of life the use of opioids (48) and time spent out of hospital (20,22,47). More recently, patient interviews and patient reported outcome measures (PROMs) have been developed to evaluate the impact of interventions on patients from their personal viewpoints (12,24,64,76).

European Association of Urology (EAU) guidelines on pain management recommend that for pelvic malignancies 'it is good practice to drain symptomatic hydronephrosis at once, and to drain only one kidney (the less dilated and better appearing kidney or the one with the better function, if known) in asymptomatic patients (77). They conclude that a nephrostomy tube is superior to a double-J stent for drainage for pelvic malignancies but advocate either stenting or nephrostomies in other tumour groups (77). Neither of these recommendations references the literature nor do they mention implications of quality of life.
In the context of locally advanced non metastatic bladder cancer with hydronephrosis, American Urological Association (AUA) guidelines suggest placement of a ureteral stent (78).

Complications

Another frequently neglected statistic for patients prior to them undergoing decompression is the proportion of time spent in hospital and the risk of complications. The proportion of patients whom had complications was 41% with 26% of patients never leaving hospital. Those who had an intervention spent 20% of their resultant lifetime in hospital. One paper stated that 69% of their patients never left hospital. Removing this apparent outlier from the pooled mean resulted in the figure of 17.8% (21). Despite improving renal function creatinine did not return to base line for patients; potentially avoiding an emergency situation but not reversing the damage caused by hydronephrosis.

Quality of life

Quality of life can be challenging to measure; early papers measured QOL using the 'useful life' measure (49,65). Feng et *al.* and Hubner *et al.* reported greater proportions of patients achieving a good QOL when compared with contemporary papers; 81-87% versus 46% (19,20,49,61,65). Whilst it is not entirely clear why there has been a reduction in patients experiencing 'useful

life'; it is possible that this may relate to patient selection, subjective clinician perception of pain and possibly the increased use of opioid medication (79). Furthermore it is likely that the progression to use of PROMs rather than relying on clinicians' opinions of what constitutes quality of life can explain in part the move from rudimentary to more patient-centered validated measures.

Three studies utilised PROMs demonstrating no statistically significant improvements in quality of life pre and post decompression (24,60,64). However, despite improvement in the use of PROMs there were several limitations with the studies. Limitations of the Monskey *et al.* study included not measuring baseline symptoms and not having a control group (64). Lapitan and colleagues, despite conducting a prospective study using FACT–BL, demonstrated lower scores pre and post decompression in comparison to other papers using FACT-G (24). This is potentially related to the association between socioeconomic deprivation, educational attainment and scores in FACT-G (80,81). A further limitation of the Lapitan *et al.* study reducing its wider relevance was the inclusion of patients solely with a diagnosis of cervical cancer.

Two papers looked at qualitative interviews. Qualitative analysis is helpful to develop themes. However a small sample size, the challenges of confounders, single tumour group inclusion and the exclusion of patients without nephrostomies may limit its wider application (12,66).

Prognostication

One group performed a prospective cohort study of patients with cervical cancer. Lapitan *et al*. followed up a cohort of patients who had malignant ureteric obstruction and assessed the outcomes of two groups; those who were decompressed and those who were not (24). At the outset, there appears to be a survival benefit with 38% versus 28% survival at six months for those who underwent decompression versus those who did not. By 12 months however, both groups had the same survival of 16% (24).

The most frequently found statistically significant indicators of poor prognosis were
low serum albumin (10,29,35,41,71), no further treatment options(3,23,37,53), number of malignancy related events (pleural effusion, metastatic disease, ascites) (10,29,35,41), performance status of 2 or worse on the European cooperative cancer group (ECOG) (9,23,53,71), the presence of metastatic disease (27,60), and hyponatremia (29,35). Two papers divided patients into groups depending on treatment options available; those with no treatment options had 0% 12 month survival and a median survival of 38 days (69,70). Combining these parameters with a larger patient group may help develop a prognostication tool for clinicians to aid decision-making.

The authors have assessed the pertinent features of poor prognosis in malignant ureteric obstruction as highlighted in this review. We feel the tool below may have some clinical utility in counseling patients for decompression

or otherwise. As readers are no doubt aware, it is not unusual for these patients to present emergently and often unwell. A simple adjunct to clinical practice could have a role in alerting clinicians to pertinent parameters to consider:

Table 5 Proposed prognostication Tool (PALLIATE)

Performance status (ECOG2)
Albumin (low)
Low serum sodium
Laterality
Inflammatory markers (CRP)
Ascites
Tumour type
Events related to cancer (pleural effusions, metastatic disease)

Comparison of prognostication tools demonstrates patients with none or 1 risk factor have a more favourable outcomes with 12 month survival ranging from 20% to 78%(27,41,69,70) and a median survival ranging between 9 and 13 months (29,35,37). In those patients with 'intermediate' risk factors (see table 4), median survival ranged from 5.7 to 8.2 months (29,35,37). For those patients with 2 or more risk factors, median survival ranged from 1.7 – 2.6 months(29,37) and 12 month survival ranged from 0% to 12% (9,27,41,69,70)

Cordeiro *et al*., Lang *et al.* and Wong *et al*. divided complications by intervention type, with 38%, 64% and 53% of patients respectively reporting complications with nephrostomies (9,27,58). The rate of complications for stents was 56% in Wong *et al*., 48% in Lang *et al.* series and 42% in the Cordeiro *et al* series(9,27). Wong however found that there was no statistically significant difference in the rate of complications between stents and nephrostomies (9,27,58).

Limitations

The reviewed data has significant heterogeneity making conclusions regarding specific tumour types challenging. Soulitududes *et al.* comments on the 'divergent nature of their group'. At one end of the spectrum, there are patients with very advanced disease who may not benefit from decompression, at the other are those who have further oncological and or surgical options who will naturally have a much longer life expectancy(5).

There are only nine papers including patients from the last ten years; in this time however there have been significant advances in oncological treatment options (9,10,15,29,35,41,55–57,59). Therefore, outcomes may well be influenced by more conservative historic data.

Another limitation of this analysis is the retrospective nature of the data; there were only seven papers that were prospective in nature (9,10,24,30,42,47,53). Data on survival is lacking on those patients conservatively managed with only one paper including untreated patients in its survival data which may lead to overstating median survival (24). There are clear worldwide variations in practice regarding discharge home. In one series, 69% of patients did not leave hospital after decompression (27); this contrasts with an average of 17% amongst other papers.

Limitations when reviewing prognostic tools include the fact that the majority of studies were retrospective in nature. The use of statistical analyses included univariate, paired-T as well as multivariate analysis thus limiting transferability and utility on an individual patient basis.

Conclusion

In this post Montgomery era with the concept of the ‘reasonable patient’, can we continue to justify discussing decompression without stating to patients the evidence-based risks and benefits from the emergent body of literature? (82) An overall complication risk of 41% and up to one third of patient remaining lifetime spent in hospital with a median survival of 6.4 months may encourage clinicians and patients to rethink the appropriateness of such interventions.

Implications of research

We propose a contemporary multi-centre prospective review of outcomes of this cohort of patients to enable evidence-based consultations for patients and their families. Further work in the domain of prognostication is needed to help best identify those patients who may benefit the most from decompression.

Implications of clinical practice

Consideration of the median survival in patients undergoing PCN and nephrostomies; no increase in quality of life and a complication rate of 41% should be made when deciding with patients whether they are likely to benefit from decompression. The decision to decompress a patient should be an MDT based decision integrating prognostication based research sumarised here. This should include information on disease status, performance status and treatment options.

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