Long-term survival is possible after stenting for malignant ureteric obstruction in colorectal cancer

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ABSTRACT

INTRODUCTION Ureteric obstruction is a potentially terminal event in patients with irresectable or recurrent colorectal cancer. Urinary tract obstruction is easily relieved by either two stage antegrade stenting or one stage retrograde stenting. However, there is little in the literature about outcomes after this procedure and it is unclear which, if any, patients should be offered this intervention.

PATIENTS AND METHODS This was a retrospective review of a prospectively collected database of patients diagnosed with colorectal cancer. This database comprised 1428 cases (operative and non-operative) diagnosed at a single institution. This was cross-checked with databases for patients undergoing nephrostomy and/or antegrade stenting and by clinical coding for those patients having retrograde stenting between January 1996 and October 2004.

RESULTS Thirteen patients were identified (median age, 69 years; range, 35–85 years; 9 male). The aetiology of obstruction was recurrent tumour in 6 patients and irresectable tumour in the remaining 7 patients. Two patients were discussed at a urology multidisciplinary meeting before stenting and a further two were discussed with colorectal surgeons. One patient received a palliative cystectomy and ileal conduit for a vesicovaginal fistula followed by radiotherapy. Four patients received chemotherapy after stenting. Overall median survival was 210 days (range, 13–927 days).

CONCLUSIONS Long-term survival is possible in selected patients with recurrent or irresectable colorectal cancer and malignant ureteric obstruction. This appears to be more likely in those patients in whom other treatments, particularly chemotherapy, are available.

KEYWORDS

Colorectal cancer – Nephrostomy

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The management of ureteric obstruction in patients with recurrent or irresectable colorectal cancer represents a difficult management problem. Treatment can take either the form of percutaneous nephrostomy followed by antegrade stenting a few days later (two-stage) or endoscopic retrograde stenting.

There is little data, however, on outcome after this procedure. Although ureteric stenting is a relatively simple intervention with low morbidity and mortality, medium- and long-term outcomes in the setting of recurrent or irresectable colorectal cancer are uncertain. It is unclear whether colorectal cancer patients with malignant ureteric obstruction have a potential length and quality of remaining life to justify intervention.

This study represents a review of a single unit's experience of ureteric stenting for malignant obstruction from colorectal cancer over an 11-year period.

Patients and Methods

The basis of this study was a prospectively collected database comprising all patients in a single institution with a diagnosis of colorectal cancer. The period examined was January 1996 to August 2004. This database includes both operated and non-operated patients (1428 patients). This database was cross-checked with a prospectively recorded database of patients having a nephrostomy (883 patients). Further patients were identified by use of clinical coding at discharge to identify patients who had undergone cystoscopy and who also had a diagnosis of colorectal cancer.

Case notes of patients identified by these methods were examined to check that the indication for ureteric stenting had been malignant obstruction from colorectal cancer. Patients with other causes of ureteric obstruction (commonly

Table 1 Summary of patients' details undergoing attempted ureteric stenting for colorectal cancer

Age (yr)/Sex	Site of tumour	Pre-nephrostomy treatment		Type of ureteric stent	Time from diagnosis to stent	Post-nephrostomy treatment		MDT or surgeon discussion	Outcome (post- stent)
		Surgery	Radiotherapy			Surgery	Chemotherapy		
69/F	Rectum	Defunctioning colostomy	No	Unilateral antegrade	14 days	Yes ^a	No	Surgeon	Died 927 days
35/M	Sigmoid	Sigmoid colectomy	5-FU/mitomycin	Unilateral antegrade ^b	947 days	No	5-FU/ mitomycin	No	Died 872 days
76/M	Rectum	Palliative APR	No	Unilateral retrograde	1280 days	No	5-FU/ mitomycin	No	Died 621 days
84/M	Transverse	Extended right hemicolectomy	No	Unilateral antegrade	665 days	No	No	No	Died 297 days
67/F	Rectum	Defunctioning colostomy	No	Unilateral antegrade	87 days	No	5-FU/ mitomycin	No	Died 260 days
71/M	Sigmoid	Sigmoid colectomy	5-FU/ mitomycin	Unilateral antegrade	1248 days	No	No	No	Died 216 days
76/F	Rectum	Defunctioning colostomy	No	Bilateral retrograde	430 days	No	No	No	Died 210 days
61/M	Rectum	Anterior resection	No	Unilateral antegrade	1710 days	No	No	No	Died 210 days
49/M	Rectum	Defunctioning ileostomy	No	Bilateral retrograde	410 days	No	5-FU/ mitomycin	Urology MDT	Died 86 days
85/M	Rectum	Hartmann's	5-FU/mitomycin	Unilateral nephrostomy ^c	702 days	No	No	No	Died 47 days
73/F	Rectum and lung	No	No	Bilateral antegrade	6 days	No	No	Urology MDT	Died 27 days
69/M	Rectum	Defunctioning colostomy	No	Failed bilateral retrograde ^d	13 days	No	No	Surgeon	Died 21 days
47/M	Sigmoid	Defunctioning colostomy	5-FU/ mitomycin	Unilateral antegrade	386 days	No	No	No	Died 15 days

^aRight nephrectomy, cystectomy and ileal conduit for vesicovaginal fistula secondary to irresectable pelvic disease.^bRight antegrade stent inserted as two-stage procedure. Left side also treated with antegrade stenting 22 months after right side.^cNephrostomy not converted to ureteric stent as unable to pass guidewire through stricture.^dRetrograde stenting failed and patient renal function remained stable. Plans for antegrade stenting abandoned.

unrelated calculi, often predating the diagnosis of cancer) were excluded from the study.

Results

Patient demographics

Thirteen patients were identified in whom ureteric stenting was attempted (median age at diagnosis 69 years; range, 35–85 years; 9 male). All patients had radiological evidence of hydronephrosis secondary to malignant obstruction. At the time of stenting, one patient had both a creatinine and urea within the normal range but had unilateral pain and hydronephrosis. The remaining patients had renal impairment and bilateral hydronephrosis. Median creatinine was 194 $\mu\text{mol/l}$ (range, 107–624 $\mu\text{mol/l}$) and median urea was 16.2 mmol/l (range, 4.3–28.0 mmol/l).

The site of primary cancer was rectum in 9 patients, sigmoid colon in 3 and transverse colon in one. One of the patients with rectal cancer had a synchronous primary lung cancer. Six patients had undergone resection of their primary tumour prior to stenting, 3 with curative intent and 3 for palliation. Seven patients had irresectable disease. Of these patients, 6 had had a defunctioning stoma and one patient had had no surgery. Of the 13 patients, 2 had metastatic disease at the time of ureteric stenting. Median time from diagnosis of colorectal cancer to insertion of ureteric stent was 430 days (range, 6–1710 days).

Ureteric stenting

Two-stage antegrade stenting was attempted in 9 patients. In one patient, there was failure to convert the percutaneous nephrostomy to an internal ureteric stent as the radiologist was unable to pass a guidewire through the ureteric stricture. The patient was left with a nephrostomy *in situ*. In the remaining 8 patients, two-stage antegrade stenting was successful without complication.

In the other 4 patients, stenting was attempted in a retrograde manner by cystoscopy. In one case, bilateral retrograde stenting was attempted at the same time as a defunctioning stoma for a newly presenting rectal cancer. In this patient, stenting was unsuccessful due to an inability to visualise clearly the ureteric orifices. Postoperatively, the patient's renal function remained stable and so antegrade stenting was deferred. The patient died 3 weeks later with stable renal function from carcinomatosis. In the other three cases, retrograde stenting was achieved successfully without complication.

Decision to stent

No patient in this series was referred to, or discussed at, the weekly colorectal multidisciplinary meeting (MDT) prior to stenting. Two patients were discussed at a urology MDT and in two other patients a consultant colorectal surgeon was

consulted about the decision to stent. Median urea level prior to stenting was 15.4 mmol/l (range, 4.3–28.0 mmol/l) and median creatinine level was 185 $\mu\text{mol/l}$ (range, 107–624 $\mu\text{mol/l}$).

Post-stenting management

In only one patient was ureteric stenting a bridge to surgery. This patient was defunctioned before ureteric stenting and, after decompression of the renal tract, underwent right nephrectomy, cystectomy and ileal conduit for a vesicovaginal fistula secondary to irresectable pelvic disease. She went on to have palliative radiotherapy. Four other patients had post-stenting chemotherapy.

Survival after ureteric stenting

All patients subsequently died from recurrent or irresectable colorectal cancer. Four patients never left hospital and died within 2 months of stent insertion. For the group as a whole, median survival was 210 days (range, 15–927 days). A summary of these data is presented in Table 1.

Discussion

This paper reports our use of ureteric stenting from analysis of a single-institution, prospective database of 1428 patients with a diagnosis of colorectal cancer. It is only rarely performed in our unit (in fewer than 1% of patients overall). It is, therefore, difficult to draw firm conclusions but it is clear that outcome is variable with a median survival after attempted ureteric stenting of 7 months. Four patients in this study were never fit enough to leave hospital after attempted ureteric stenting though three patients lived more than 18 months. Only 4 patients received palliative chemotherapy after ureteric stenting and one patient had palliative surgery and radiotherapy for symptoms of a vesicovaginal fistula.

Much of the data on ureteric stenting in malignant disease relates to non-colorectal malignancy. The present study provides some guidance, therefore, to clinicians and urology and colorectal MDTs treating advanced colorectal cancer patients with ureteric obstruction.

Two-stage antegrade stenting is more often successful than single-stage retrograde stenting. A recent study reported 100% success for two stage antegrade stenting as compared to only 21% for retrograde stenting.¹ Reasons for this discrepancy were cited as including trigonal distortion in pelvic cancer, failure to negotiate the lower segment of the ureter and post-operative scarring causing difficulty in visualisation of the ureteric orifices. Treating the ureteric obstruction in an antegrade manner may also be more effective because the dilated proximal ureter acts as a funnel to passage of the guidewire. The greater success rate of antegrade stenting compared to retrograde stenting has

also been supported in another recent study.² However, the decision over whether to use an antegrade or retrograde approach will also be determined by availability of resources and expertise.

There are a number of small series in the literature reporting ureteric stenting for pelvic malignancy, though many of these relate predominantly to urogynaecological cancer. A recent study reported on 65 patients undergoing either antegrade or retrograde stenting (including 3 rectal cancers) and found that of the 14 who had died by the end of follow-up, mean survival was 12 months.¹ By contrast, a further series from London reported on 42 patients with a range of pelvic malignancies. Median survival was only just over 4 months for all cancers. However, 40% of patients survived more than 6 months and the best outcomes after stenting were seen in those patients who had further adjuvant treatment after urinary tract decompression.⁵

The applicability of results from series comprising predominantly urogynaecological cancers to patients with colorectal cancer is uncertain. A recent paper⁴ reported on 32 patients with a range of different cancers (including 5 rectal and 2 sigmoid cancers). Median survival in this study was 3 months from the time of stent insertion, though it was slightly better in the colorectal subgroup (128 days median survival). The authors believed that 'useful quality of life; was seen in fewer than half of patients overall. They also stated that they felt that tumour type affected outcome. Patients with gynaecological malignancies appeared to have a better outcome when compared with other groups, particularly bladder cancer.⁴

One large series⁵ has looked specifically at stenting for colorectal malignancy. It reported 52 patients with ureteric obstruction. Ten patients had malignant obstruction from primary colorectal cancer. Forty-two patients had undergone resection for primary colorectal cancer 1–84 months previously. Recurrent malignancy was the cause of obstruction in 38 of these patients; benign stricturing (fibrosis 2 patients, postoperative ureteral stricture from operative injury 2 patients) was the cause in the remaining four patients. In total, 5 patients (two with primary cancer and three with recurrent disease) underwent surgical resection with intent to remove all disease. Median survival was 6 months in this subgroup. The remaining 43 patients with malignant obstruction comprised 8 patients with primary cancer and 35 with recurrent cancer. Survival was 8 months in the palliative surgery/no treatment group and thus, paradoxically, better than in the 'complete surgical resection' group. It is difficult to interpret the outcomes of this study as patients with 'benign' causes of hydronephrosis are included and median follow-up was short. Furthermore, details of surgery, particularly 'palliative surgery' are scant and there is no detail about chemotherapy and radiotherapy.

Conclusions

Our results, and those in the literature reviewed above, suggest that ureteric stenting is possible with low morbidity. This raises the issue of whether the threshold for offering this intervention should be lowered. By preventing death from renal failure, however, the patient may be subjected to progressive pelvic malignancy with symptoms that may be difficult to palliate.

The MDT should play an important part in identifying the patient who might benefit from ureteric stenting. Particular focus should be on the further treatment options open to the patient and potential quantity and quality of life left. The present study suggests that patients who receive chemotherapy after ureteric stenting may survive for many months. This interpretation should be treated with some caution, however, as clearly patients need to survive in the short-term after ureteric stenting before adjuvant treatments can be considered.

Certainly, rectal cancers should be viewed separately from other pelvic malignancies. With the advent of better chemotherapy and the more wide-spread use of pre-operative radiotherapy for rectal cancer, ureteric stenting may be more widely used in the future as a bridge to surgery with curative intent rather than as a purely palliative procedure.

With the benefit of hindsight, four of the patients survived less than 50 days after stenting and were probably not well served by stenting. One of these four patients had a separate advanced primary lung cancer and was probably inappropriately stented. Once a stent is *in situ*, it is very difficult to remove with the express intent of allowing the patient to die from renal failure. However, the alternative of death from advanced pelvic malignancy may be very distressing and difficult to palliate.

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