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Original Article

Is it necessary to embolise all spinal metastases from primary renal tumours?

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ABSTRACT

Introduction: Spinal metastases secondary to renal cell carcinoma are associated with significant intra-operative blood loss. Our aim was to assess if embolisation reduced the intra-operative blood loss and transfusion requirement.

Methods: We performed a retrospective cohort study of 25 patients undergoing surgery between 2003 and 2011.

Results: 14 underwent pre-operative embolisation; 11 did not. There was no significant difference in intra-operative blood loss, 1336 ml vs 1492 ml in the non-embolised (p value = 0.116). 43% of embolised patients required an intra operative blood transfusion vs 27% in the non-embolised.

Conclusion: Our results suggest that not all patients with spinal metastatic renal carcinoma require pre-operative embolisation.

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1. Introduction

Spinal metastases develop in 5–10% of all cancer patients,¹ and renal carcinoma metastases are associated with increased intraoperative blood loss relative to other tumour types.² Current studies suggest that as many as 83% of these metastases are hypervascular on angiographic studies.³

Current best practice guidelines on the management of metastatic renal carcinoma suggest that, prior to any operative intervention on the metastatic deposits, they should undergo pre-operative embolisation to reduce the risk of catastrophic blood loss at the time of surgery. A lot of the published data on

this topic are from the 1970s and 1980s^{4–7}; in 1974, Benati et al. concluded that multiple published case series' had successfully demonstrated the effectiveness of pre-operative embolisation. Success rates throughout the literature vary from 37 to 96%,^{3,8} with complication rates varying from 1 to 32%.^{3,8} Complications of pre-operative embolisation are not inconsequential; they range from transient paraesthesia and radicular pain to spinal cord ischaemia, epidural haemorrhage and permanent paraparesis. Despite this, current recommendations remain that all metastases from renal carcinoma should undergo embolisation prior to surgery.^{9,10}

It was the opinion of the senior author of this paper that this may not always be the case. The number of operations

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performed each year in our region for spinal cord metastases has seen a dramatic increase over the last 10 years. Less than 20 operations were performed in 2000, and this number has seen an increase of greater than 400% in the last 10 years, and continues to rise. Our hypothesis was that, contrary to current practice, it is not necessary to embolise all metastases from primary renal carcinoma. The procedure carries significant risks, has significant cost implications and often delays waiting times for surgery and therefore increases length of hospital stay.

We performed a retrospective cohort study of all patients admitted to our unit for spinal surgery with a diagnosis of metastatic renal carcinoma. Current practice in our unit is to refer all of these patients for preoperative embolisation. We aimed to assess whether embolisation was actually performed, whether it reduced intra-operative blood loss and the need for transfusion of blood products intra-operatively.

2. Methods

All patients undergoing spinal decompression and stabilisation for metastatic renal carcinoma between 2003 and 2011 were initially included in the study. Records for each patient were obtained from the interventional radiology department of our hospital. All patient case notes were reviewed, along with operation notes, intraoperative anaesthetic charts and preoperative MRI scans, by 2 separate individuals. As this was a retrospective study, measurement of the effectiveness of embolisation was difficult. It was decided that the effectiveness of embolisation could be estimated by obtaining information on intra-operative blood loss, quantity of blood products transfused intra-operatively, along with pre- and post-operative haemoglobin levels.

3. Results

Over the timeframe of the study, a total of 26 patients with metastatic renal carcinoma were admitted to our unit for surgery. One set of case notes could not be located therefore 25 cases were used in the final analysis. All patients were referred for consideration of pre-operative embolisation of the metastatic deposit. Of the 25 people referred for embolisation, 14 underwent successful embolisation of the metastatic deposit whilst 11 patients returned having not undergone embolisation. The reasons for these 11 patients not undergoing embolisation were either no tumour blush/enhancement seen after angiography ($n = 8$) indicating the absence of a feeding vessel to the tumour deposit, or procedure not felt to be safe due to presence of neighbouring spinal or vertebral artery ($n = 3$). All 11 of these patients subsequently went on to have their surgery as initially planned, without preoperative embolisation. Intraoperative blood loss was recorded for 20 of the 25 patients, 10 in the embolisation group and 10 in the group that did not undergo embolisation. There was no significant difference in intraoperative blood loss between the two groups; mean blood loss in the embolisation group was 1336 ml whilst in the non-embolisation group mean intra-operative blood loss was 1492 ml ($p = 0.116$). Regarding

intraoperative transfusion of blood products, 43% ($n = 6$) of the patients who had undergone embolisation preoperatively required blood transfusion intra-operatively. This is in contrast to 27% ($n = 3$) of the non-embolised group requiring transfusion intra-operatively. To evaluate haemoglobin concentrations we looked at pre-operative and day one post-operative haemoglobin levels as recorded on the laboratory system. 36% ($n = 5$) of the patients in the embolisation group had a drop in haemoglobin concentration of 2 g/dL or more, compared with 73% ($n = 8$) in the non-embolised group. This may in part be explained by the fact that more patients in the embolisation group received intra-operative blood products therefore minimising haemoglobin drops in the immediate post-operative period. We then adjusted for this, accepting that transfusing one unit of packed red blood cells will increase the haemoglobin concentration by approximately 1 g/dL.¹¹ Therefore using this assumption, after adjusting for intra-operative blood transfusion we found that 71% ($n = 10$) of patients in the embolisation group had a haemoglobin drop of greater than 2 g/dL, compared with the previously stated 73% in the non-embolisation group.

4. Discussion

Having been carried out retrospectively, we appreciate that our study has its limitations and, in order for us to make any evidence based recommendations for changing current clinical practice, a well-designed prospective study would have to be undertaken. However, we have shown that in our group of patients, not all spinal metastases from primary renal carcinoma necessarily require pre-operative embolisation in order to prevent massive blood loss as previously stated in the literature. It may well be that those tumours which did not undergo embolisation were in essence self-selecting themselves as non-hypervascular metastases. We do not recommend that surgeons begin to operate on renal carcinoma metastases without prior angiographic evaluation. Our study has shown that after angiographic evaluation of these metastases, almost 50% of them did not necessitate progression on to embolisation. In conclusion, we suggest that these metastases should be pre-operatively evaluated with MRI and angiography, to assess their size and hypervascularity instead of all being presumed to require embolisation prior to surgical resection.

Conflicts of interest

The authors have none to declare.

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