

Does the TNM staging criteria predict survival in patients with small bowel neuroendocrine tumours?

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Background:

Small bowel NETs are the most common gastrointestinal NETs. SEER data analysis has demonstrated an increasing incidence (460%) of small bowel NET over the last 30 years (1). They commonly arise in the ileum often presenting late with metastatic spread. However, can also present acutely with small bowel obstruction or be identified co-incidentally.

Over recent years formalized staging systems to help accurate staging of these tumours have been developed. Consequently studies have looked to identify whether stage of disease correlates with survival.

Furthermore, studies have looked to determine whether tumour grade using the criteria suggested by ENETS is predictive of survival.

Aims :

To retrospectively stage patients with known small bowel primary NETs from a single institution and determine whether survival is correlated with stage and grade of disease.

Methods :

One hundred and thirty-eight patients were identified as having a small bowel NETs from the Kings NET database.

Of these patients a complete dataset was available for 118.

The radiological, surgical and histopathology notes were reviewed to extract the relevant parameters. Due to the low number of patients with stage 2a and 2b disease these groups were combined together.

Also stage 3a and 3b were combined.

Statistical analysis was performed using Microsoft Excel and

GraphPad Prism 5.1. Kaplan-Meier plots were constructed to determine survival.

Stage	T-primary tumor	N-regional nodes	M-distant metastasis
Disease stages			
Stage I	T1	N0	M0
Stage IIA	T2	N0	M0
Stage IIB	T3	N0	M0
Stage IIIA	T4	N0	M0
Stage IIIB	Any T	N1	M0
Stage IV	Any T	Any N	M1

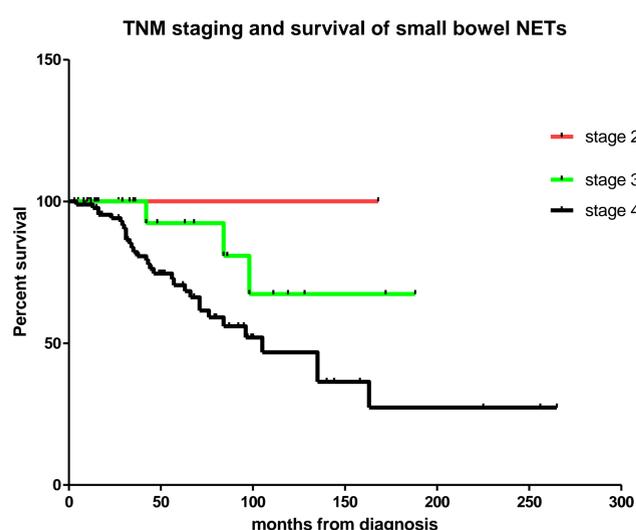
TNM	
T-primary tumor	
TX	Primary tumor cannot be assessed
T0	No evidence of primary tumor
T1	Tumor invades mucosa or submucosa and size ≤ 1 cm
T2	Tumor invades muscularis propria or size >1 cm
T3	Tumor invades subserosa
T4	Tumor invades peritoneum/other organs
For any T add (m) for multiple tumors	
N-regional lymph nodes	
NX	Regional lymph nodes cannot be assessed
N0	No regional lymph node metastasis
N1	Regional lymph node metastasis
M	Distant metastasis
MX	Distant metastasis cannot be assessed
M0	No distant metastases
M1*	Distant metastasis

Table 1. ENETs TNM classification for small bowel NETs (lower jejunum and ileum).

Results:

Of the 138 patients analysed the median age was 61 years (range 24-84).

Stage	Number of cases
I	0
II	4
III	23
IV	91



Kaplan- Meier plots were constructed these demonstrated a significant difference in survival between patients with different stage of disease (P=0.03). There was no significant difference in survival between stage 2 and stage 3 tumours.

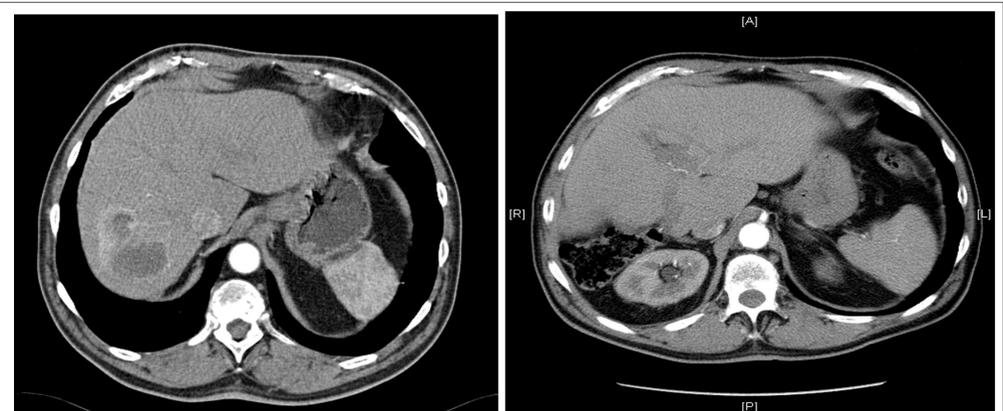


Figure 1. Left image Arterialised CT image, demonstrating NET in right lobe liver. Right image post operative image demonstrating resection of liver metastases without evidence of further disease.

Grade of tumours

There were 46 patients with G1 tumours (ki67 $\leq 2\%$) and 18 patients with G2 tumours (Ki67 3-20%).

There was a significant survival difference between G1 vs. G2 grade of tumours (p=0.049).

Conclusion

This study demonstrated a significant survival difference between tumour stage and survival. There was no difference in survival between stage IV and stage III and stage II disease. No difference between stage 2 and stage 3 disease, this in part could be due to the small study numbers for stage 2 disease.

There were no patients with G3 tumours (Ki67 >20) for analysis. There was significant survival difference between G1 and G2 tumours.