

Incidence of Nodal Positivity in Appendiceal Neuroendocrine Tumors (NETs) and Its Effect on Survival

Eugene A. Woltering, MD^{1,2}, David T. Beyer, BS², Yi-Zarn Wang, DDS, MD^{1,2}, Robert A. Ramirez, DO¹, J. Phillip Boudreaux, MD^{1,2}
¹Ochsner Health System, Kenner, LA, USA ²Louisiana State University Health Sciences Center, New Orleans LA, USA

Introduction

- Neuroendocrine Tumors (NETs) of the appendix are rare neoplasms most commonly discovered during appendectomies for other causes
- We attempted to determine the effect of size on the incidence of nodal positivity among appendiceal NETs and its effect on survival.

Methods

- Forty-eight patients who had a histologically confirmed appendiceal NET seen at the Neuroendocrine Tumor Program were identified via an eVELOX patient database.
- Patients were included that underwent appendectomy or right hemicolectomy.
- Patients diagnosed with goblet cell carcinoid or appendiceal adenocarcinoma were excluded.
- Median survival (months), 5-year and 10-year survival rates were calculated by the Kaplan-Meier Survival Method.
- Dual LSU Health Sciences Center and Ochsner Medical Center-Kenner Institutional Review Board approval was obtained.

Results

Patient Characteristics (N=48)	N (%)
Mean Age at Diagnosis (Range)	43 (13-83)
Sex	
•Male	16 (33%)
•Female	32 (67%)
Tumor Size	
•Less than 1 cm	12 (25%)
•1-2 cm	17 (35%)
•Greater than 2 cm	19 (40%)
Surgical Procedure	
•Appendectomy only	11 (23%)
•Right Hemicolectomy only	4 (8%)
•Appendectomy with subsequent Right Hemicolectomy	33 (69%)
Nodal Involvement	
•Positive	18 (38%)
•Negative	30 (63%)
Lymphovascular Invasion	13/36 (36%)
Perineural Invasion	14/31 (45%)
Invasion of Mesoappendix	14/37 (38%)

Results

Nodal Involvement Sorted by Tumor Size

Tumor Size	N, (%)	Positive Lymph Nodes	Negative Lymph Nodes
<1 cm	12 (25%)	5/12 (42%)	7/12 (58%)
1 – 2 cm	17 (35%)	5/17 (29%)	12/17 (71%)
>2 cm	19 (40%)	8/19 (42%)	11/19 (58%)

Survival Stratified by Tumor Size and Lymph Node Involvement

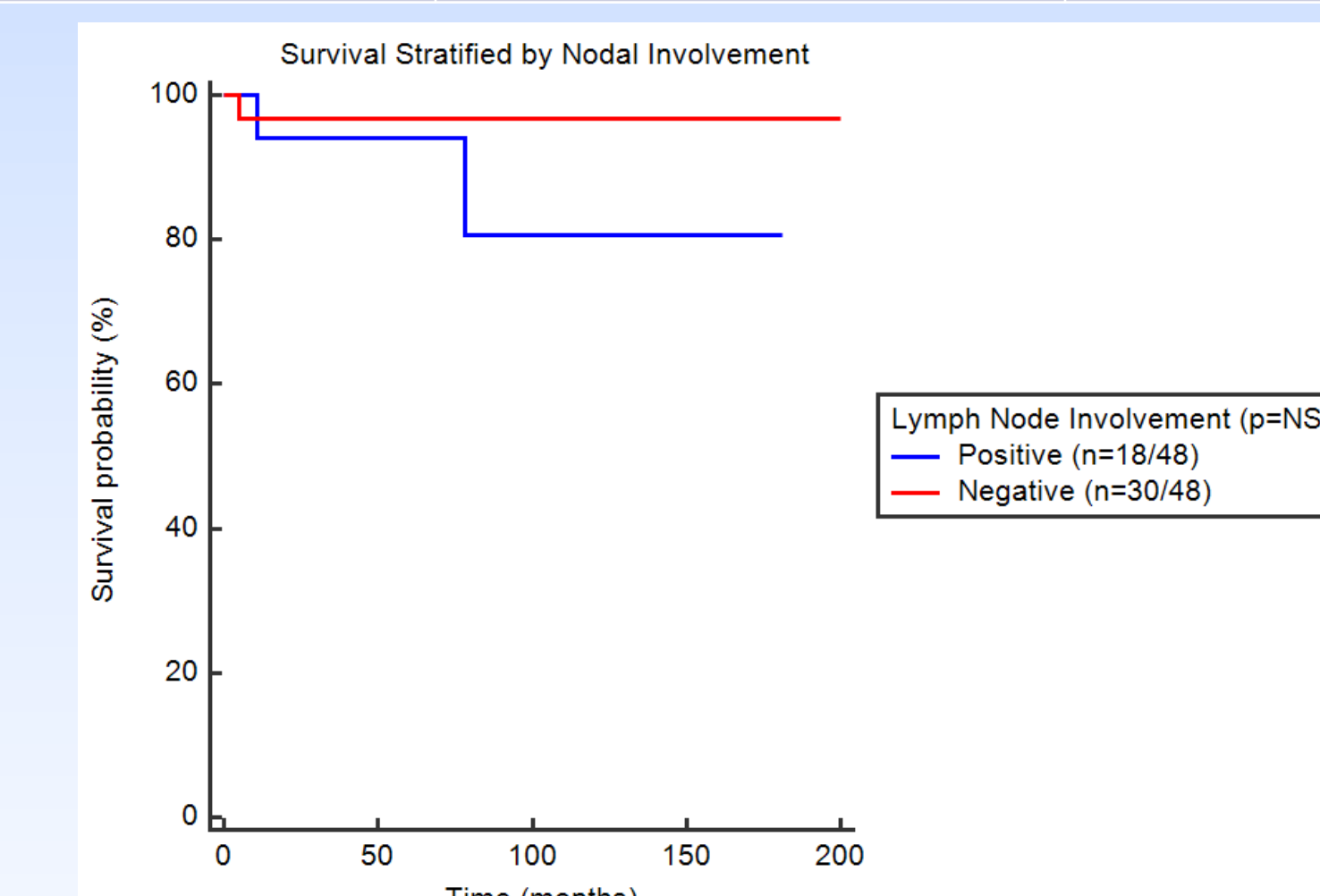
LN Involvement	Tumor Size	N	5-year Survival	10-year Survival
Positive	< 1 cm	5	80%	53%
	1-2 cm	5	100%	100%
	> 2 cm	8	100%	100%
Negative	< 1 cm	7	100%	100%
	1-2 cm	12	100%	100%
	> 2 cm	11	91%	91%

- Median Overall Kaplan-Meier Survival was not reached.
- **5-year Survival Rate = 95%**
- **10-year Survival Rate = 91%**

Results

Survival Stratified by Nodal Involvement

	Positive Lymph Nodes	Negative Lymph Nodes
N (%)	18 (38%)	30 (62%)
Deaths	2/18	1/30
5-year survival rate	94%	96%
10-year survival rate	81%	91%



Conclusion

- Patients with appendiceal NETs have high 5-year and 10-year survival rates.
- Lymph Node Positivity decreases the survival of patients with well-differentiated appendiceal NETs by ten percent.