

The Changing Presentation of Pancreatic Neuroendocrine Tumors: Results of 341 Resected Patients over 30 years



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Introduction

- Pancreatic neuroendocrine tumors (PanNETs) have been increasing in incidence in recent years(1-3). Recent case series have suggested an increase number of these tumors being resected (4,5). We sought to determine how the presentation of patients undergoing resection for PanNETs has changed over the last 30 years at a single institution.

Methods

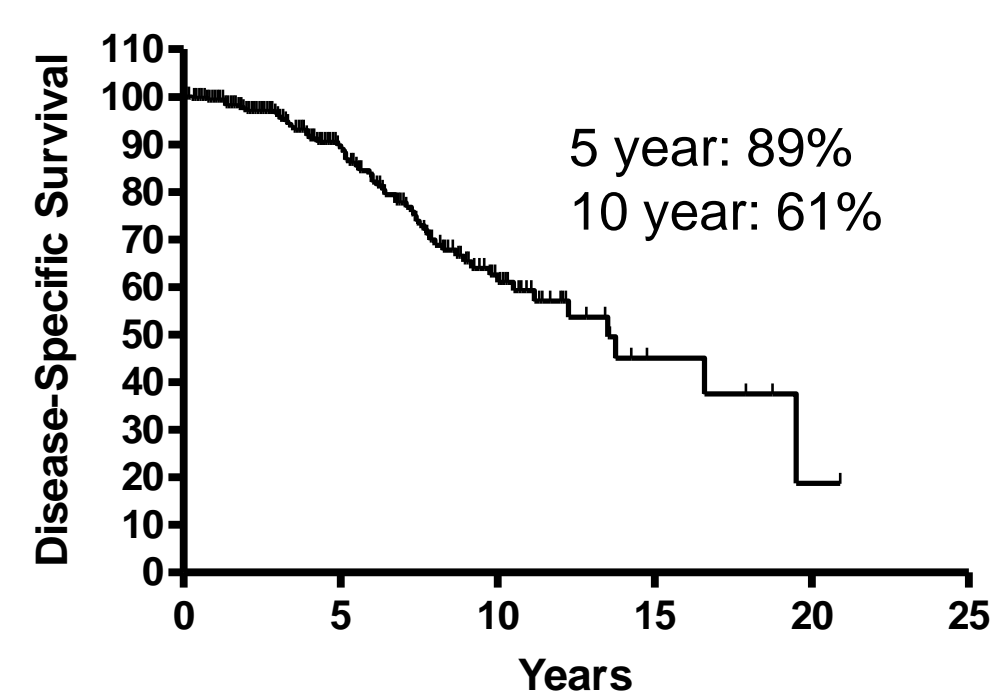
- A retrospective review of a prospectively collected database was carried out between 1983-2012. Patients undergoing pancreatic resection for PanNETs were included. Tumor grade (intermediate and low) was assigned based on the WHO classification.

Results

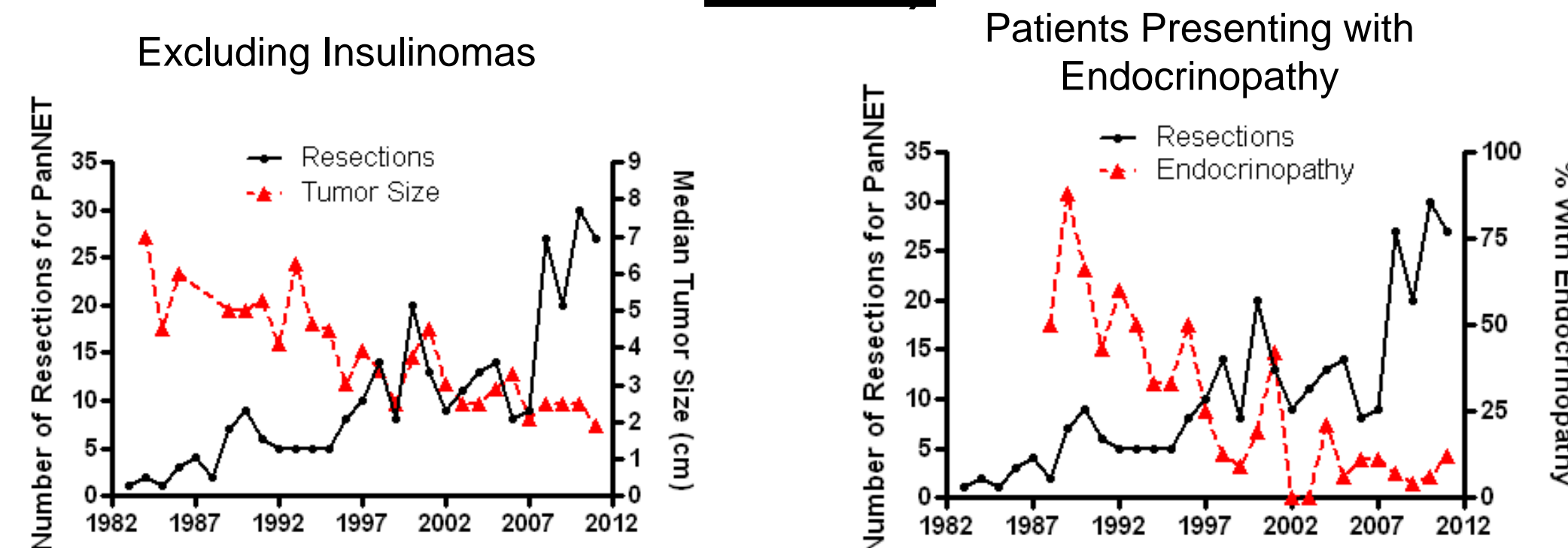
Table I: Patient Characteristics

Variable	Resected PanNET Patients (n=341)
Age (yrs)	56 ± 13
Gender	
Male	166 (49%)
Female	175 (51%)
Endocrinopathy	
Functional	66/329 (20%)
Non-functional	263/329 (80%)
Asymptomatic	96/271 (35%)
Tumor Size (cm)	3.6 ± 3
Lymph Node Mets	72/249 (29%)
Liver metastases identified at presentation	34/341 (10%)
WHO Low Grade	208/244 (85%)
WHO Interm Grade	36/244 (15%)

Disease-Specific Survival in All Patients



Pancreatic Resections of PanNET at MSKCC (1983-2012)



Recurrence-Free and Overall Survival by Decade

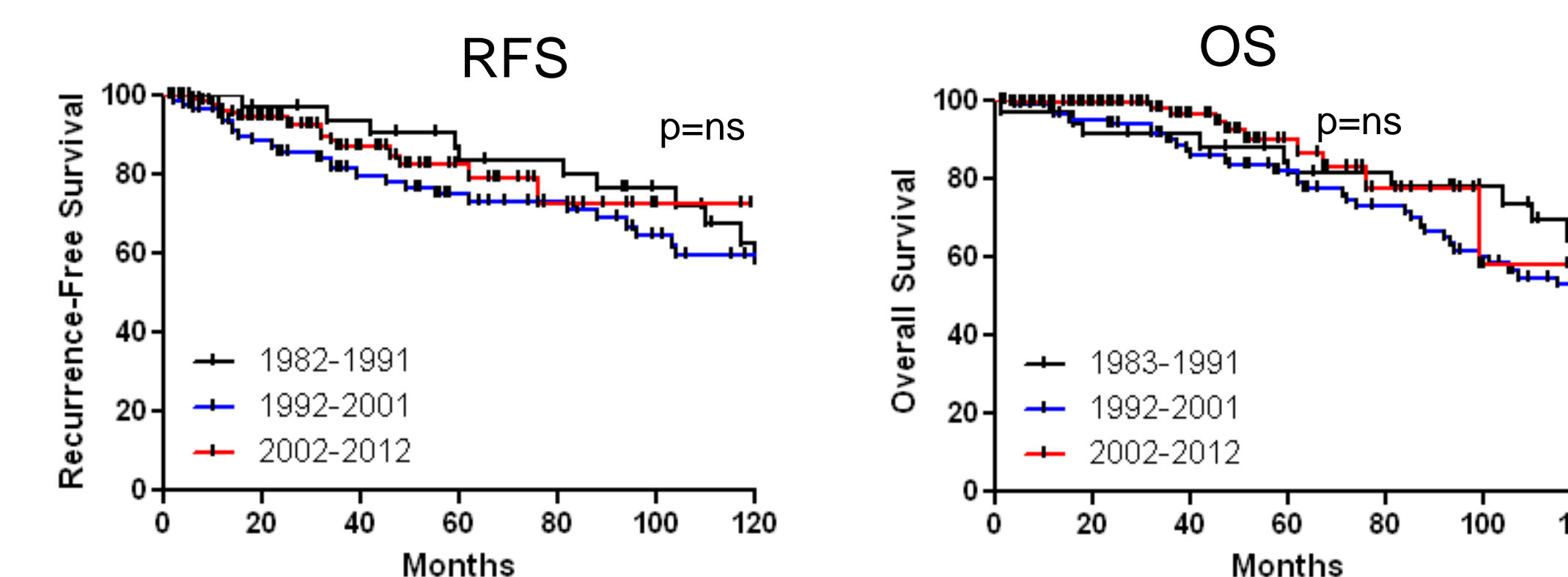


Table IV: Median Survival

Decade	Median F/U (Months)
1982-1991	109
1992-2001	77
2002-2012	26

Why are more patients with smaller, non-functional tumors being resected?

Table II: Incidental tumor identification

Purpose of Imaging Study	Number of Patients (n=96)
Malignancy Surveillance	29
Urologic/Renal w/u	20
Thoracic w/u	10
Orthopedic w/u	10
Abdominal w/u	9
Malignancy w/u	7
Routine Physical	6
Vascular Screening	3
Gyn w/u	2
Trauma	2

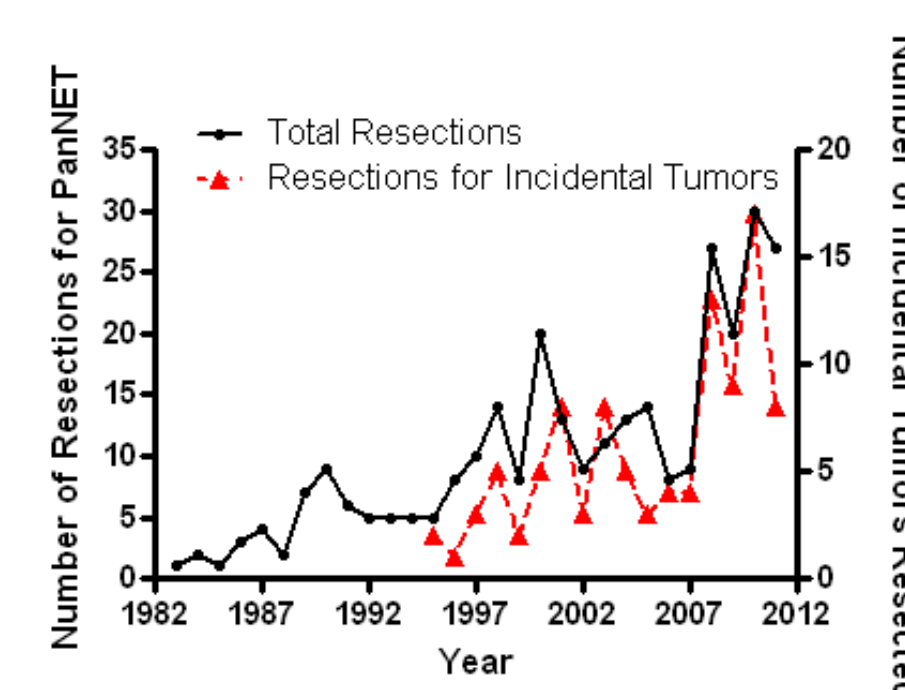
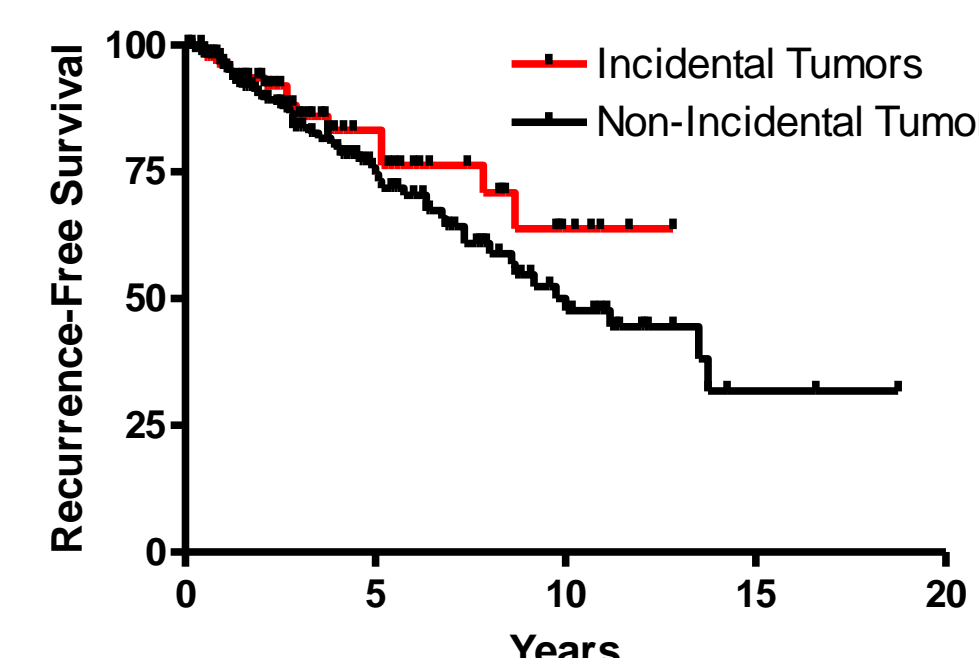


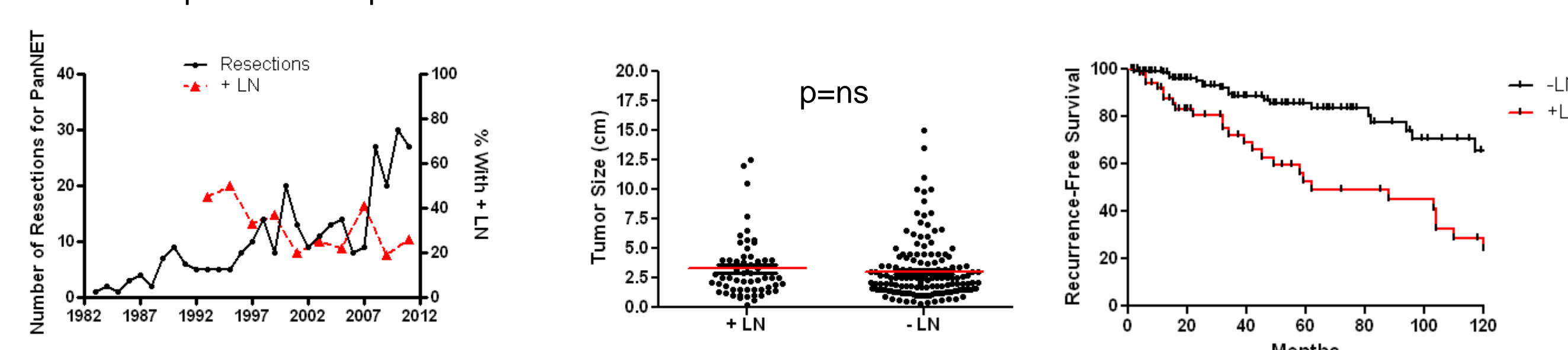
Table III: Incidental tumor characteristics

Variable	Incidental Tumors (N=96)	Non-Incidental Tumors (N=175)	P value
Age	58 ± 12	56 ± 13	NS
Tumor Size	3.0 ± 1.8	3.7 ± 3	NS
LN Metastases	14/73 (19%)	37/130 (28%)	0.17
WHO Intermediate Grade	7/85 (8%)	23/128 (18%)	0.06

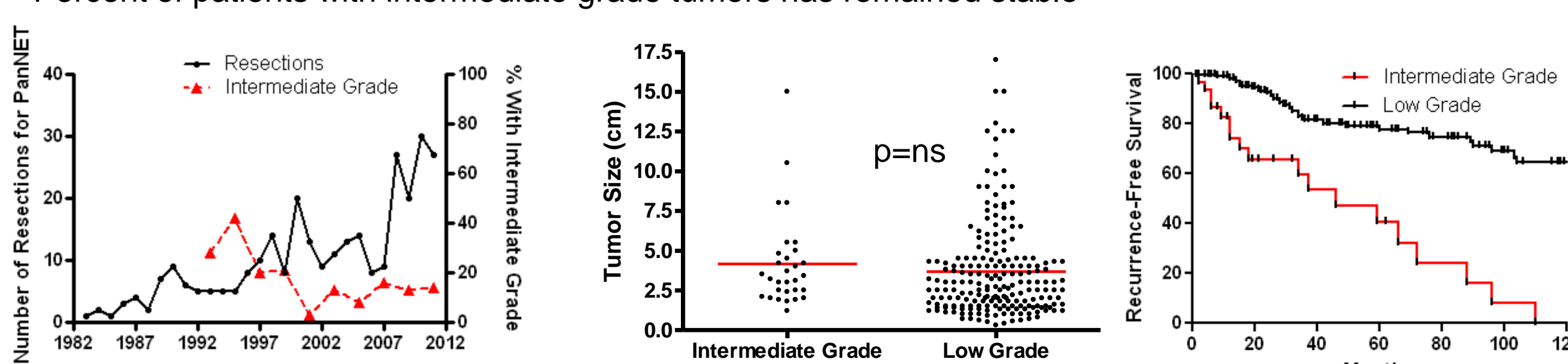


Why are incidental and non-incidental tumors similar with respect to recurrence-free survival?

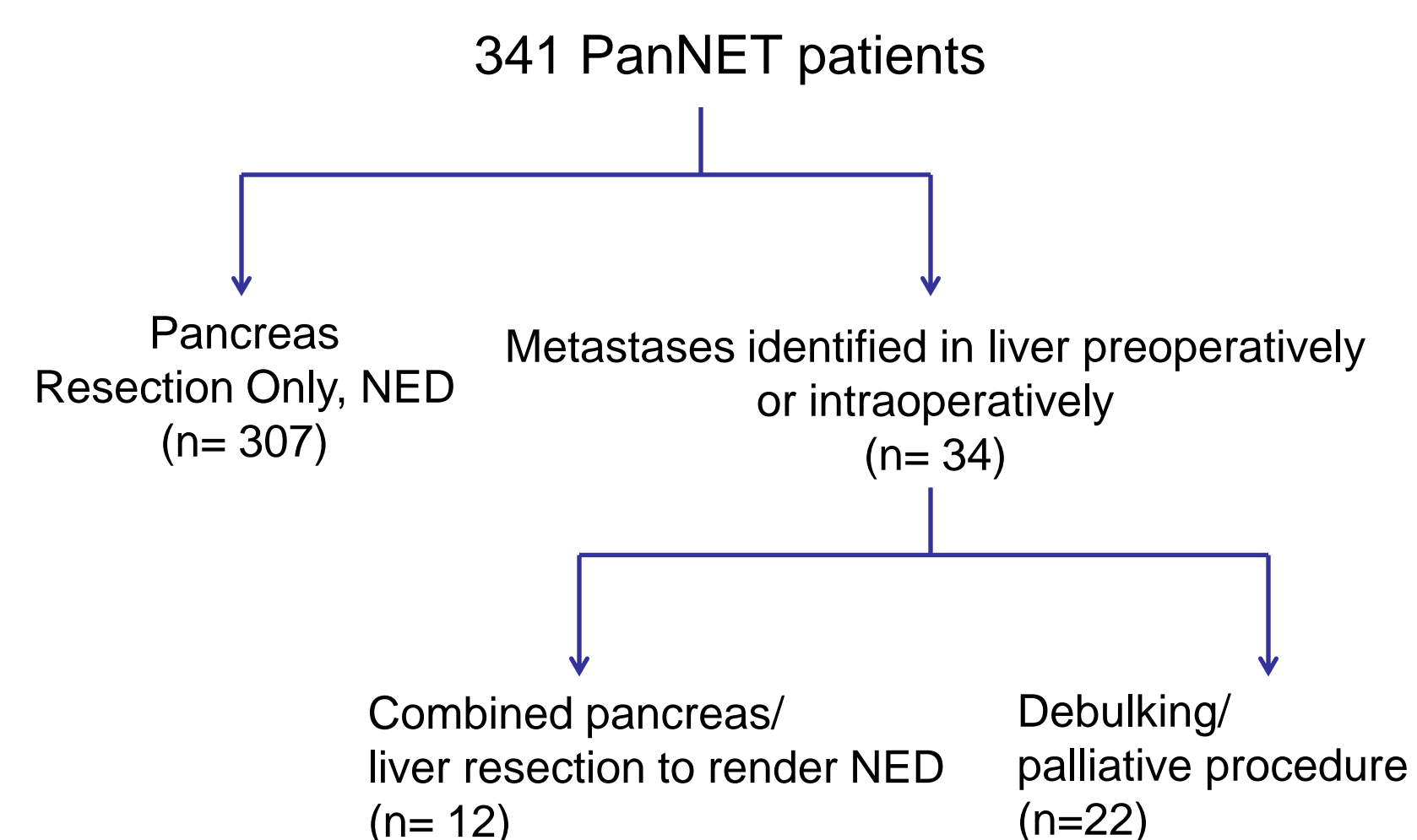
Percent of patients with positive LN's has remained stable



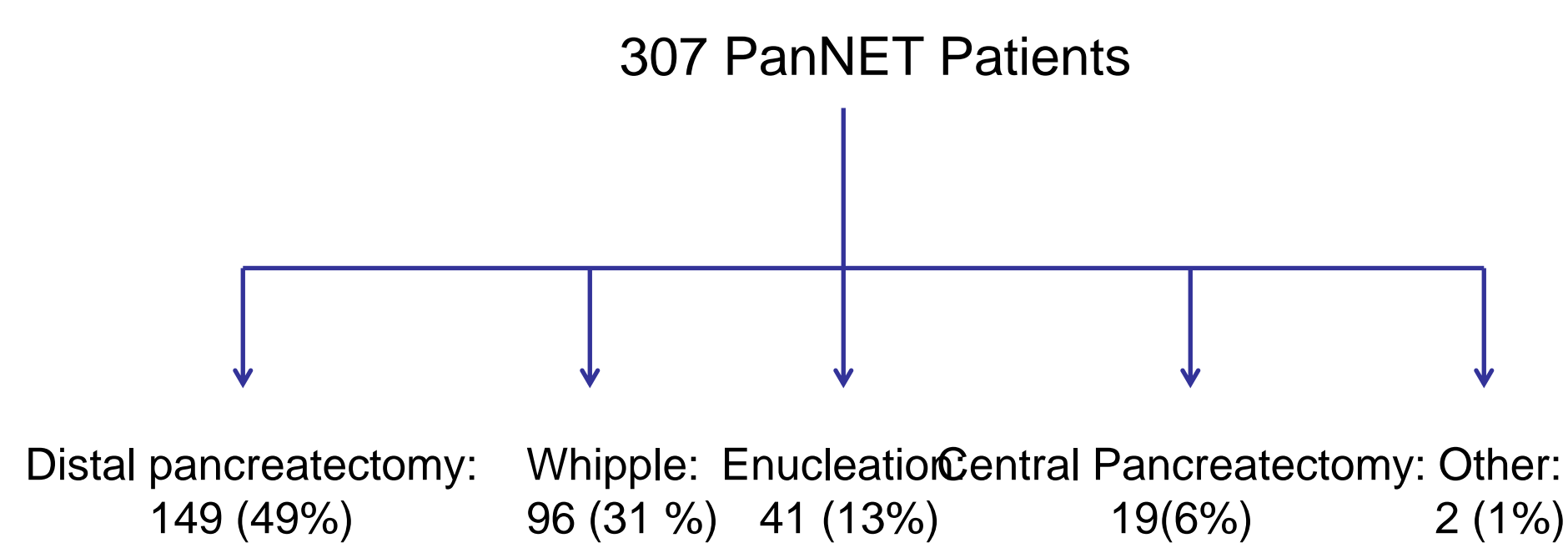
Percent of patients with intermediate grade tumors has remained stable



PanNET Patients Undergoing Pancreatic Resection at MSKCC (1983-2012)



PanNET Patients Undergoing Curative Pancreas Resection



Recurrence in 52 Patients (17%) with average f/u of 54 months

Results Summary

- Pancreatic resections for PanNET are increasing
- Patients' average tumor size has steadily decreased likely due to increased rates of cross-sectional imaging studies
- Despite a greater number of incidental patients undergoing resections, the rate of lymph node metastases and the percentage of patients with intermediate grade tumors has remained constant
- Smaller tumors can have lymph node metastases and can be intermediate grade

Conclusions

- Resection should be considered in select patients with small PanNETs
- Tumor recurrence remains a problem and further adjuvant strategies should be investigated

References

- Kimura et al., Dig Dis Sci 1991
- Bruzoni et al., Am J Surg 2008
- Yao et al., JCO 2008
- Vagefi et al., Arch Surg 2007
- Haynes et al., Arch Surg 2011