**Comparison of endoscopic ultrasound guided fine needle aspiration or biopsy for the diagnosis and accurate grading of pancreatic neuroendocrine tumours using surgical pathology as the gold standard.**

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**Introduction:** Pancreatic neuroendocrine tumours (pNET) are a distinct tumour type with outcomes dependent upon markers such as Ki67 and grading. Previous data shows fine needle aspiration (FNA) cytology at endoscopic ultrasound (EUS) may not be able to accurately determine Ki67 or grading. Our aim was to assess whether Ki67 and grade can be more accurately determined using fine needle biopsy (FNB) compared to FNA using surgical histology as the gold standard.

**Methods:** Retrospective analysis of all pancreatic pathology for neuroendocrine tumours was performed over the period Jan 2009 - Jun 2017. Patients were included if they had undergone EUS guided sampling of the lesion prior to surgical resection. Patient demographics, lesion size and location were noted. FNA and FNB results were examined and Ki67 and grade recorded. Surgical histology reports were examine and time from EUS to surgery, operation performed, TNM stage, Ki67 and grade recorded and compared using correlation coefficient and proportional analysis.

**Results:** 162 patients were diagnosed with pNET in our centre over the study period of which 55 underwent surgical resection (mean age 55.7, 30 males). 23 lesions (mean size 24.5mm) were located in the head, 9 in the body and 26 in the tail of the pancreas of which 39 were solid, 8 cystic and 8 mixed morphology. On surgical histology 32 lesions were grade 1, 22 were grade 2 and 1 was grade 3. 33 lesions underwent FNA and 25 FNB (3 lesions underwent both) all of which confirmed pNET on cytology or histology respectively. There was no significant difference in the median number of days from FNA or FNB to surgery (81 vs. 66 days, p=0.32). 21/33 FNA samples could report Ki67/grading compared to 25/25 FNB samples (p=0.0006). Ki67 on FNA showed a weak correlation with surgical pathology (R=-0.0789) whereas Ki67 on FNB showed a moderate correlation (R=0.6693). 14/33 FNA samples matched the surgical grade compared to 19/25 FNB samples (p=0.015).

**Conclusion:** Both FNA and FNB can be used to confirm a diagnosis of pNET. However, FNB samples were more likely to provide adequate material for Ki67/grading and show a closer relationship to final surgical histology.