



# Comparison the Accuracy of Ct Scan and Endosonography in Abdominal Vascular Invasion in Pancreatic Cancer at Firoozgar Hospital

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**Abstract:** *Introduction: Definitive treatment for pancreatic cancer is surgical resection, endosonography and contrast ct scan are current preoperative methods for assessment the resectability in this cancer. In this study we evaluated and compare the accuracy (ppv,npv) and sensitivity , specificity of these two methods in pancreatic cancer vascular invasion. Method: 46 cases with pathologically and surgically proved adenocarcinoma were evaluated. in all patients ct scan with contrast ,EUS and surgery were performed. Retrospectively the result of these modalities in vascular invasion compared with surgical findings as a gold standard. Result: 3 cases were male, 15 were female. the mean age in male was 57 years old , and 55 in female. The majority of masses was in pancreatic head. The accuracy and sensitivity and specificity of ct scan was more than EUS. Conclusion: Although many studies evaluated the accuracy of endosonography and ct scan in the local staging of pancreatic cancer vascular invasion. Few had evaluated these modalities for the detection of vascular invasion based on surgical results. In patients who are being considered for resectional surgery, ct scan with contrast and EUS became the standard imaging modality in the preoperative assesment.*

**Keywords:** *Pancreatic Cancer, Vascular Invasion, Ct Scan, Endosonography*

## INTRODUCTION

Pancreatic cancer is associated with a poor prognosis, with less than 5% of patients surviving 5 years after diagnosis. Surgical resection remains the only chance for curative therapy in these patient. Accurate preoperative staging of pancreatic cancer is essential to avoid unnecessary surgery in those patients with unresectable disease and, by the same token, not to deny the opportunity for cure in patients with resectable disease (Bugls et al.; Baghbanian et al., 2013; Midwinter et al., 1999). However, upon surgical exploration, only 5% to 25% of the tumours are amenable to curative resection. Helical pancreatic protocol multi-detector computerized tomography (MDCT) scan and endoscopic ultrasonography (EUS) have improved the preoperative determination of tumor surgical resectability. MDCT scan is a choice modality in order to evaluate pancreatic neoplasms and to determine respectability (Angela et al., 2013). But EUS has been shown to be superior for detection of small tumors and lymph nodal involvement.

EUS also has the highest accuracy in predicting tumor resectability, becoming able to demonstrate invasion of vascular structures, portal and superior mesenteric veins<sup>3</sup>. Unresectability criteria of the pancreatic adenocarcinoma in EUS and/or helical pancreatic protocol MDCT are the following: (Bugls et al.) distant metastasis (liver, peritoneum), (Baghbanian et al., 2013) arterial encasement of the celiac axis or superior

mesenteric artery(SMA), and/or (Midwinter et al., 1999) occlusion of the portal vein or superior mesenteric vein (SMV) (Mancuso et al., 2006).

The criteria for vascular invasion in ct scan were an abrupt change in vessel caliber with or without collateral vessels"loss of the interface between the vessel and the mass or intraluminal tumor extension.4. the criteria for vascular involvement were any of the following: tumor in lumen, abnormal vessel contour, presence of collateral vessels, loss of the hyperechoic interface between the tumor and the vessel (Claudio De Angelis et al., 2007).

In this study we evaluate abdominal vascular invasion in ct scan and endosonography, in patients with pathologically proved pancreatic adenocarcinoma with surgical findings.

### **Method:**

Between 1393 to 1396, 46 patients which are pathologically proved for pancreatic cancer were registered. Ct scan with contrast, endosonography (EUS) and surgery was performed in all cases. The data from these methods were reviewed and collected retrospectively. We evaluated and compared the EUS and ct scan findings in vascular invasion with surgical findings as gold standard.

The criteria for exclusion were: presence of metastasis, involvement of peritoneal cavity, cystic masses of pancreas.

The gold standard was surgical and pathological results. Paired analysis of the evaluation of major vessel structures (superior mesenteric vein, superior mesenteric artery, celiac artery. Portal vein, hepatic artery) was performed.

Then data was gathered in SPSS 21, then McNemar's and chi square used to compare the accuracy, positive predictive value, negative predictive value, sensitivity and specificity of ct scan and EUS.

All of EUS procedures were carried out by two endosonographers with Olympus GF-UC 240p.

And data from ct scan Siemens 16 slice with standard pancreatic protocol with and without contrast.

### **Results:**

46 patients with pancreatic adenocarcinoma were enrolled.

31 cases were male and 15 cases were female. The mean age in female was 55 years old with min=39, max=72 years old. The mean age in male was 57 years, min=40, max=84.

The lesion was situated in the head of pancreas in 40 cases (86%), 3 cases in body, 2 cases in uncinate process and one case in tail of pancreas.

#### **Superior mesenteric artery invasion:**

The SMA was invaded in 13 cases surgically, there was no significant difference between ct scan and surgical findings (P value=.453). The difference between EUS and surgical findings was significant.

Ct scan sensitivity, specificity, PPV, NPV and accuracy in SMA invasion were sequentially 84%,84%,68%,93% and 84%.

EUS sensitivity, specificity, PPV, NPV and accuracy in SMA invasion were sequentially 38%,72%,35%,75% and 63%.

#### **Superior mesenteric vein invasion:**

The SMV was invaded in 19 cases surgically, there was no significant difference between ct scan and surgical findings in SMV invasion. The difference between EUS and surgical findings was significant.

Ct scan sensitivity, specificity, PPV, NPV and accuracy in SMV invasion were sequentially 84%,96%,94%,89% and 91%.

EUS sensitivity, specificity, PPV, NPV and accuracy in SMV invasion were sequentially 52%,74%,58%,68% and 65%.

#### **Portal vein invasion:**

The portal vein was invaded in 10 cases surgically. There was no significant difference between EUS and ct scan with surgical findings, which could be due to less invasion to portal vein in this study.

**Celiac artery invasion:**

Also celiac artery was invaded just in 3 cases surgically, which ct scan could predict 2 cases, and EUS did not report any of these.

**Hepatic artery invasion:**

Hepatic artery was invaded surgically in 6 cases. Which ct scan predict 4 of this cases. And EUS just predict 1 case. Ct scan was more accurate than EUS.

**Discussion:**

Although there are many studies evaluating the accuracy of EUS and ct scan in the local staging of pancreatic cancer and vascular invasion, few have evaluated these imaging modalities for the detection of vascular invasion, based on surgical results.

In patients who are being considered for resectional surgery, ct scan with contrast and EUS had become the standard imaging modality in the preoperative assessment.

Previous studies have compared ct scan and EUS, Palazzo et al found that EUS to be more accurate than ct scan for the diagnosis of pancreatic cancer and more accurate for venous invasion (Bugls et al.).

In our study EUS had poor sensitivity, specificity, ppv, npv and accuracy in vascular invasion such as superior mesenteric artery, superior mesenteric vein, portal vein and hepatic, celiac artery.

Which is different from many studies done before.

This study finds that ct scan had more sensitivity, specificity, npv, ppv and accuracy.

**Acknowledgement:**

No financial grants were received. The authors have no conflict of interests.

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