

RECENT UPDATES IN THE ROLE OF MULTI-DETECTOR COMPUTED TOMOGRAPHY IN EVALUATION OF PANCREATIC CANCER RESECTABILITY

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Introduction

Pancreatic cancer has one of the worst prognosis among all malignancies and is projected to become the second leading cause of cancer-related deaths in certain regions. It is the fourth leading cause of cancer-related deaths worldwide. It is unfortunate to note that pancreatic cancer has a low 5-year survival rate of 2% to 9%, which remains consistent across both high-income and low- to middle-income countries. This survival rate also varies by location and country, but it never exceeds 10%. Furthermore, patients with non-resectable pancreatic cancer are expected to have an even lower 5-year survival rate. Adenocarcinoma is the most common type of pancreatic cancer . The name 'silent killer' has been given to this cancer because it progresses silently, has late clinical signs, and grows rapidly. Two-thirds of pancreatic masses develop in the head of the pancreas. Despite advancements in imaging and treatment, pancreatic adenocarcinoma is still a fatal disease.

Aim of the work

The main goal of our study was to assess the recent updates in the role of MDCT in prediction of resectability of pancreatic cancer.

Patients and Methods

Target population: The study was carried out on 42 patients with approved manifestations of cancer pancreas who admitted to Alexandria main university hospital and Gamal Abdel Naser insurance hospital for diagnosis and management. **Before CT imaging, all individuals were subjected to:** 1- Informed written consent, 2- Full history and clinical examination, 3- General and abdominal examinations by the referral clinician, 4- Laboratory investigations. 5- **maging techniques:** A 160-channel multi-detector CT scanner (Toshiba Aquilion Prime Machine ,Edogawa-Ku, Tokyo, Japan) was used to perform Bi-phasic CT according to a pancreas protocol. **Bi-phasic protocol and scan timing:** After triggering the bolus tracking threshold of 50 H.U. of the aorta at the corresponding celiac axis level, scanning delay was 5 s for early arterial phase, 10-15 s (or within 30s of contrast injection) for pancreatic phase , and within 30s after pancreatic phase (or 60-70 s after the start of injection) for venous phase .our patients then classified according to the National Comprehensive Cancer Network (NCCN) Guidelines for CT resectability of Pancreatic Cancer (version 1.2022) into four clinical stages (resectable, borderline resectable, locally advanced, and metastatic).

Results

Table (1): Distribution of the studied cases according to location of tumour (n = 42).

Location	No.	%
Head	30	71.4
Body	8	19.0
Tail	4	9.5
Uncinate process	15	35.7

Table (2): Distribution of cases according to status of resectability (n=42).

	No.	%
Status		
Irresectable	24	57.1
Resectable	15	35.7
Borderline	3	7.1

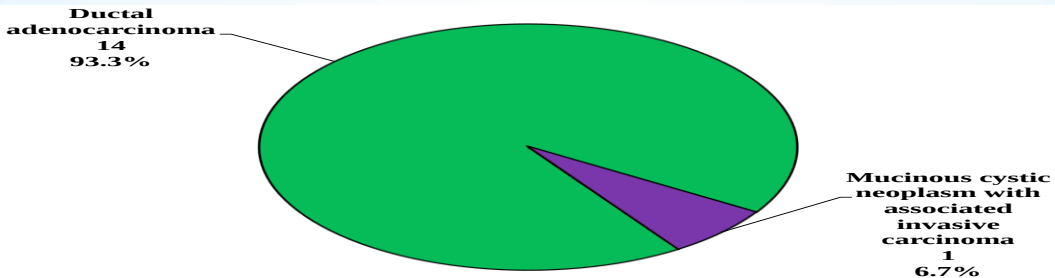


Figure (1): Classification of studied resectable cases according to histological type (n=15).

Table (3) : Correlation between preoperative CT, Surgical outcome and postoperative pathological safety margin results.

Status of resectability	Preoperative CT	Surgical Outcome	Safety margin (R -ve).
Resectable	17	15	12

Sensitivity = TP / (TP + FN) = 15 / (15 +0) = 100 %
Positive predictive value (PPV) (Precision), when comparing CT findings to surgical outcome = TP / (TP + FP) = 15 / (15 + 2) = 88.2%
PPV (when comparing CT results to pathologic findings) = 70.5%
The overall estimate of resectability in the studied sample = 15 / 42 = 35.7 % Case presentation



Figure (2): CT pancreatic protocol (arterial phase) of 58 year old female patient

(a) axial section showing a hypo-attenuating pancreatic head mass lesion with no vascular contact or distant metastasis. Mass is considered resectable according to NCCN criteria. pre-liminary CT staging was T2 Nx. lesion was resectable at surgery.

Histo-pathology revealed; pancreatic ductal adenocarcinoma, grade 2, staging PT3N1 with infiltrated pancreatic surgical safety margin.(true positive case).

Figure (3): A 30 year old male patient presented by obstructive jaundice and vomiting
(b) a hypoattenuating soft tissue lesion noted at pancreatic head with ≥180° degree of contact with the SMA.
(c) MPD dilatation with no parenchymal atrophy. Mass is irresectable according to NCCN criteria.

Conclusion

The location, size, and severity of the tumor can be determined efficiently using multi-detector computed tomography (MDCT), a non-invasive method that we found to be an accurate tool for detecting and staging pancreatic cancer. Based on the NCCN criteria for predicting R0 resection, our findings suggest that CT can be utilized to identify pancreatic cancer patients who have a high probability of undergoing R0 resection; According to our study's findings, CT has a 70.5 % % positive predictive value in predicting R0 resection.Careful consideration of patient selection and surgical technique can reduce the risk of a positive margin resection (R1, R2). A realistic perspective about the patient's age and health situation, the likelihood of recovery following surgery, peri-operative morbidity and mortality, and the quality of life following tumor resection are all important considerations when considering heroic surgery.