

# DILATED MAIN PANCREATIC DUCT WITHOUT A VISIBLE PANCREATIC MASS: LONG-TERM FOLLOW-UP AND PREDICTORS OF FUTURE PANCREATIC DUCTAL ADENOCARCINOMA

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## Background

- Pancreatic ductal adenocarcinoma (PDAC) is a lethal disease frequently diagnosed at an advanced stage.
- Pancreatic imaging abnormalities that predate diagnosis of PDAC may serve as an early detection tool.
- Dilation of the main pancreatic duct (D-MPD) has been shown to occur up to a year before PDAC diagnosis.<sup>1</sup>
- D-MPD in the absence of a visible pancreatic mass raises concern for occult neoplasm.

**Aim:** To assess long-term outcomes of D-MPD and compare patients with D-MPD who were subsequently diagnosed with PDAC to those who did not develop PDAC.

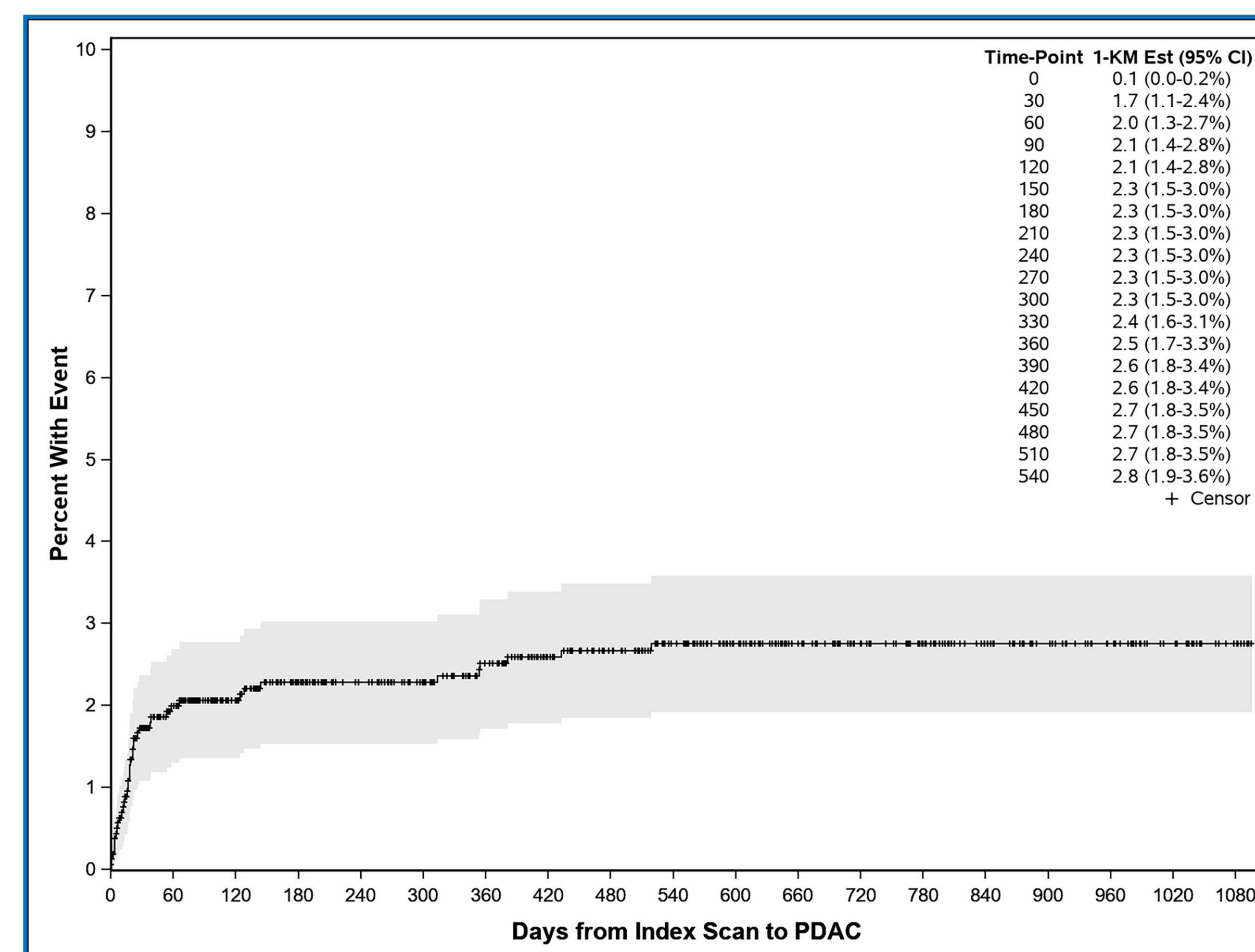
## Methods

- **Inclusion criteria**  
Adults ≥18 years with D-MPD (MPD >3mm) on either CT/MRI abdomen/pelvis between 2012 and 2017.
- **Exclusion criteria**  
Patients with prior PDAC, pancreatic surgery, definite pancreas mass or other visible cause of D-MPD.
- **Analysis Plan**  
A stratified univariate Cox proportional hazards model was utilized to evaluate risk factors for PDAC development.

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**Table 1. Univariate Stratified Survival Analysis assessing the risk of developing PDAC within 3 years from baseline CT/MRI in 2307 patients with D-MPD**

Characteristics	Reference	Hazard Ratio	95% HR CI	p-value		
Age (years)	≥50	< 50	7.11	0.98	51.19	0.0515
Body Mass Index (kg/m2)	≥25	< 25	1.97	1.17	3.32	0.0105
Maximum MPD diameter (mm)	≥5-< 10	≥3-< 5	3.77	1.99	7.17	< .0001
	≥10	≥3-< 5	20.08	8.46	47.69	< .0001
Serum CA19-9	≥35	< 35	23.75	3.14	179.87	< .0001
Gender	Male	Female	1.94	1.18	3.18	0.0088
ABO Blood type	Type Non- O	Type O	2.24	1.16	4.31	0.0161
Alcohol	Ever Use	Never Use	1.03	0.61	1.73	0.9137
Aspirin	Ever Use	Never Use	0.94	0.53	1.64	0.8177
Diabetes mellitus	Yes	No	2.59	1.55	4.34	0.0003
Chronic Pancreatitis	Yes	No	0.38	0.09	1.58	0.1847
Acute Pancreatitis	Yes	No	1.13	0.55	2.26	0.7609
Family History of PDAC	Yes	No	1.95	0.93	4.1	0.0772
Pancreas Cyst on imaging	Yes	No	1.44	0.86	2.43	0.1688
Equivocal Mass on imaging	Yes	No	12.52	7.25	21.64	< .0001
Image Quality	Suboptimal but diagnostic	Optimal	2.24	1.31	3.84	0.0033
Focal narrowing of MPD	Present	Absent	6.23	3.79	10.23	<0.001



**Figure 1: Kaplan-Meier curve estimate of PDAC event rates over the 3-year followup duration**

1. Singh DP, Sheedy S, Goenka AH, et al. Computerized tomography scan in pre-diagnostic pancreatic ductal adenocarcinoma: Stages of progression and potential benefits of early intervention: A retrospective study. *Pancreatolgy*. 2020;20(7):1495-1501. doi:10.1016/j.pan.2020.07.410

## Results

- Among 2307 patients (CT:1615, MRI: 692) who met study criteria, 63.7% were female, median age was 71 (IQR 59.5 - 80.1), and median follow-up was 1466 days (95% CI 1426-1509).
- The 1-year and 3-year event rates for PDAC were 2.70 and 2.99 per 100-patient years respectively. Out of sixty-three (2.7%) patients who developed PDAC within 3 years of the baseline scan, the majority (58/63) were within 1 year. (Figure1)
- Factors associated with a significantly increased 3-year risk of PDAC included male gender, BMI >25, diabetes mellitus, non-O blood type, elevated serum CA 19-9, focal narrowing of MPD, equivocal pancreatic mass and suboptimal baseline scan quality (Table 1).

## Conclusions

- D-MPD may predate the diagnosis of PDAC and raises concern for neoplasm. However, in our study only a small subset of D-MPD patients without an overt pancreatic mass developed PDAC on follow-up.
- The risk is highest in the first year with rare events after one year of PDAC-free follow-up.
- Risk factors identified in this study may enrich assessment and guide surveillance of patients with D-MPD.
- Future studies exploring machine learning tools may further enhance the identification of those at risk of future PDAC and facilitate early detection.