Percutaneous vs. EUS-guided celiac plexus neurolysis in pancreatic cancer

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BACKGROUND

Celiac plexus neurolysis relieves pancreatic cancer pain and can be delivered percutaneously under image guidance or by EUS-guided transmural injection.

Guidelines favor EUS, yet the head-to-head evidence is a single 60-patient RCT plus indirect network meta-analyses. No large real-world comparison existed.

OBJECTIVE

Compare the two guidance approaches on opioid burden, hypotension, healthcare utilization, and mortality in a large federated cohort.

METHODS

Retrospective cohort, TriNetX US Collaborative Network (45 health systems), 2015-2024.

Adults with pancreatic cancer (ICD-10 C25) who underwent percutaneous (CPT 64680) or EUS-guided (CPT 43253) neurolysis; arms made mutually exclusive.

1:1 propensity matched on 19 covariates (metastatic disease, ascites, chemotherapy, radiation, biliary obstruction, baseline pain, baseline opioids). All SMD < 0.1.

Outcomes at 30 / 90 / 180 / 365 days as risk ratios. Vaccination encounter = falsification endpoint; endoscopic intervention = positive control.

RESULTS

After matching, 921 patients per arm were analyzed (all SMD < 0.1). 95% of both arms were already on opioids at baseline.

1.00 RR

Opioid burden is equivalent

365-day any-opioid-fill risk ratio: opioid burden identical between approaches

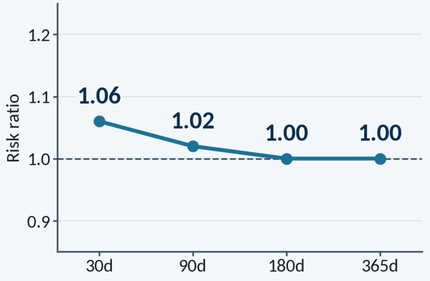


Fig 1. Any-opioid-fill RR ~1.0 at every window; only the 30-day estimate reached significance, far inside the confounding floor.

2.0 ×

Early hypotension, then decay

30-day hypotension risk after percutaneous neurolysis, decaying toward null by one year

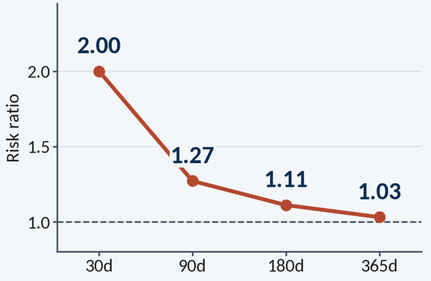


Fig 2. Hypotension RR spikes at 30 days then decays, the signature of an acute procedural complication rather than confounding.

0.63 RR

Positive control separates

Positive control: ~1.6× more endoscopic intervention in the EUS arm, confirming arm assignment

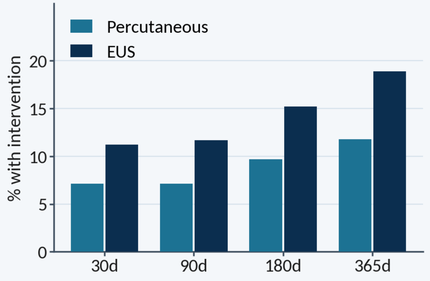


Fig 3. Endoscopic biliary/pancreatic intervention consistently higher in EUS at every window. Arm assignment validated.

154 d

Mortality gap is confounded

Median survival percutaneous vs. 225 d EUS, but inside the confounding floor, not causal

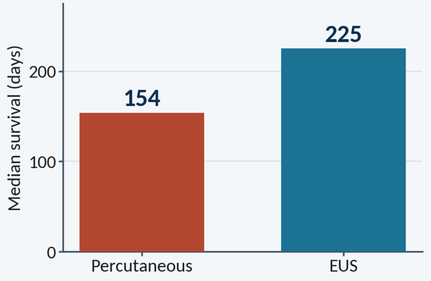


Fig 4. Median survival 154 vs 225 d. Pre-match metastatic disease 58.8% vs 32.3%; reported descriptively only.

CONCLUSIONS

The two guidance approaches deliver equivalent opioid control through one full year. **Percutaneous neurolysis carries roughly double the early hypotension risk**, an expected consequence of acute sympathetic blockade. Everything else, mortality included, sits within the residual-confounding floor set by the falsification endpoint and cannot be read as a treatment effect.

The validated pillars: arm assignment confirmed via the endoscopic-intervention positive control, the confounding floor set clean by a null vaccination endpoint, and exposure validity supported by the acute hypotension pattern.

An adequately powered randomized comparison of hard outcomes is warranted.

KEY REFERENCES

1. Yoon WJ, et al. EUS-guided vs percutaneous celiac neurolysis in unresectable pancreatic cancer: a randomized clinical trial. J Clin Med. 2020;9(6):1666.

2. Okita M, et al. EUS-guided celiac plexus neurolysis: a network meta-analysis of RCTs. J Clin Gastroenterol. 2023;57(10):1054-1062.

3. NCCN Clinical Practice Guidelines in Oncology: Pancreatic Adenocarcinoma. NCCN.

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Scan for the full abstract and contact details.

Non-human-subjects research (de-identified, aggregated data), exempt from IRB review per institutional policy.