Morbidity and mortality following pancreatectomy after neoadjuvant therapy for borderline resectable and locally advanced pancreatic cancer: benchmarked outcomes and quality monitoring in a UK specialist centre

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BACKGROUND & AIMS

Resection remains the only potentially curative treatment for pancreatic ductal adenocarcinoma (PDAC).

Neoadjuvant therapy (NAT) enables selected patients with borderline resectable (BR) or locally advanced (LA) disease to proceed to surgery.

These operations are technically demanding, frequently involving vascular resection, and postoperative morbidity may disrupt subsequent oncological treatment.

Aim: evaluate institutional morbidity, mortality and textbook outcome following pancreatectomy after NAT, using available international benchmarks.

METHODS

- Retrospective cohort of consecutive patients undergoing pancreatectomy after NAT for BR/LA PDAC at Queen Elizabeth Hospital Birmingham.
- **Study period:** October 2017–April 2025; follow-up censored 1 September 2026.
- 82 patients included in peri-operative analyses; 81 included in survival analyses.
- **Primary outcome**: major complication, defined as Clavien–Dindo (CD) grade ≥3.
- **Secondary outcomes**: 30- and 90-day mortality, length of stay, textbook outcome, adjuvant chemotherapy and survival.
- Complex resection defined by LA disease, arterial resection or temporary mesocaval shunt.

COHORT PROFILE

82	45.1%	70.7%
patients	complex resections	venous resection

- Median age 63 years (IQR 56–70)
- 87.8% received FOLFIRINOX-based NAT
- Median 8 cycles (IQR 6–12)
- 62.2% borderline resectable / 37.8% locally advanced

'Complex Resection' was defined as any resection performed for borderline resectable and/or locally advanced disease, requiring the use of temporary mesenteric shunting and/or arterial resection.

STUDY CONSIDERATIONS

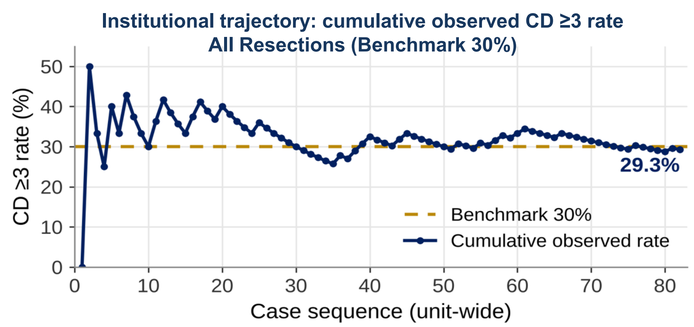
- Retrospective, single-centre cohort with a modest sample size.
- Available benchmarks were derived from lower-risk populations and are not specific to NAT; the complex-resection comparator is an approximation.
- Associations between complications, adjuvant treatment and survival do not establish causation

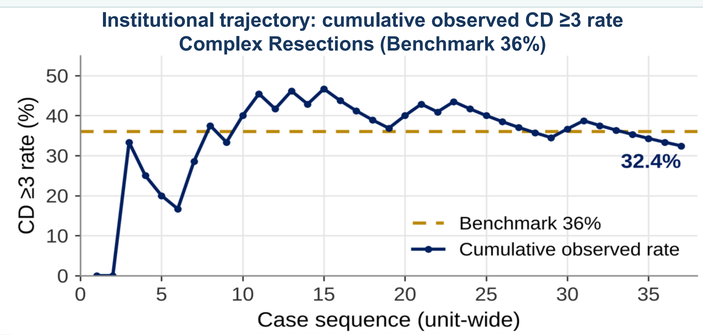
KEY RESULTS

29.3%	9.8%	61.0%
Major complications	**90-day mortality**	**Textbook outcome**
24/82; benchmark 30%	8/82	50/82

Peri-operative outcomes by resection complexity

Outcome	Typical (n=45)	Complex (n=37)	All (n=82)	p
Major complication (CD ≥3)	26.7%	32.4%	29.3%	0.63
30-day mortality	8.9%	8.1%	8.5%	1.00
90-day mortality	8.9%	10.8%	9.8%	1.00
Length of stay, median days	10.0	12.0	10.5	0.21
Textbook outcome	64.4%	56.8%	61.0%	0.50





INTERPRETATION

- The overall major-complication rate (29.3%) was within the 30% international reference benchmark.
- Complex resections had a major-complication rate of 32.4%, below the 36% comparator benchmark; morbidity and textbook outcome did not differ significantly from typical resections.
- Textbook outcome was achieved in 61.0%, comparable with the 60.3% reported in a Dutch nationwide cohort.

LONG TERM OUTCOMES

- Major complications were associated with lower adjuvant chemotherapy receipt (23.5% vs 56.6%; p=0.03).
- Adjuvant non-delivery was more frequent after a major complication (72.7% vs 34.2%; p=0.04).
- Median overall survival was shorter with major complication (12.3 vs 32.4 months; p=0.001).
- Median disease-free survival was 11.5 months; recurrence occurred in 72.7% of patients surviving to discharge

RECOMMENDATIONS

Establish risk-adjusted outcome measures that account for operative complexity, including vascular and multivisceral resections, rather than relying solely on benchmarks derived from lower risk cohorts.

Undertake multicentre studies to generate larger, representative datasets from which reliable benchmark thresholds for major morbidity, mortality and textbook outcomes can be established.

Standardise outcome reporting to facilitate meaningful comparison between institutions and support ongoing surgical quality monitoring.

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CONCLUSION

In this cohort, major complications occurred in 29.3% of patients overall and 32.4% following complex resection, remaining below the available 36% complex-resection comparator.

However, existing benchmarks are not specific to patients undergoing pancreatic resection following neoadjuvant therapy and may not adequately account for the complexity of these procedures.

KEY MESSAGE

The authors suggest that dedicated, risk-adjusted benchmarks for complex pancreatic resection should be developed. More appropriate benchmarks are needed to enable meaningful outcome comparison, quality monitoring and improvement in surgical care.

Benchmarks: Sánchez-Velázquez et al., Ann Surg 2019 (all, 30%); Raptis et al., Ann Surg 2020 (PD with portomesenteric venous resection, 36%). p values: Fisher's exact and Mann-Whitney U tests.