



Disease-Specific Surgical Benchmarking: A Nuanced Approach to Operative Outcomes

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In the recently published issue of *Annals of Surgical Oncology*, Alaimo et al. have published their work on establishing global benchmarks in perioperative and oncological outcomes following surgery for intrahepatic cholangiocarcinoma (ICC).¹ This global collaboration includes reputable high-volume HPB units from both eastern and western centres who have collated their data to provide a reference standard for others to compare to or aspire towards.

Benchmarking has been in vogue in recent years in the surgical literature having been adopted from the business sphere.² An ever-increasing body of literature has shown benchmark outcomes following major liver and pancreas resection.^{3,4} Hitherto, most of these studies have been authored by high-volume institutions and since a volume-outcome relationship has been established in major HPB surgery, benchmarking can allow all institutions (regardless of volume) to evaluate their practice and address any potential deficiencies via quality-improvement initiatives. Such outcome-oriented studies are important for settings where case-volumes may be low but excellence in care can be demonstrated via comparison with a published benchmark. However, one shortcoming of most of these studies is that they are procedure-specific rather than being disease specific. Since HPB pathology is heterogeneous around the world (especially in the context of liver disease between east and

west) and the risk profile of an individual operation may be considerably different depending on the disease (e.g. pancreatic fistula rates after pancreaticoduodenectomy for duodenal cancer rather than pancreas cancer), it is important to have benchmark outcomes that are disease-specific. This study takes an important step in the pursuit of disease-specific outcome measurement in liver surgery.

Alaimo et al have spent considerable effort on underpinning their outcomes of interest on a biological foundation. The study considers both minor, major and extended hepatectomy and evaluates adequacy of lymphadenectomy. It also includes detailed metrics of pathological assessment and tumour burden. The global input has ensured an impressive 600 cases receiving contemporary care including patients receiving neoadjuvant chemotherapy. The selection criteria have also ensured that both major and minor hepatectomy are studied and there has been a stated effort to avoid undue emphasis on just complex hepatectomy. Although the use of minimally invasive techniques is recorded in the study, it has quite appropriately not been proposed as a benchmarking measure focusing instead on clinical outcomes with the implicit suggestion that these can be achieved via the surgical technique most suited to the patient and institution. The study does not propose any patient-reported outcome measures which warrant future evaluation.

Although cases requiring biliary or vascular resection were excluded from benchmarking analysis, over a third of patients in the complete dataset of 1193 patients required this with a further ten percent requiring extended hepatectomy (which were included in the benchmarking analysis). Patients with a BMI over 35 or more than ASA 3 are similarly excluded. Benchmarking methodology tries to determine the best achievable outcomes in the best, typical patients. Thus, the published outcomes should be seen in this context as most units evaluating their outcomes following surgery for intrahepatic cholangiocarcinoma may look at their outcomes *en masse* rather than excluding high risk

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cases. This represents an important intrinsic methodological limitation of benchmarking studies rather than an issue specific to this study.

The authors should be congratulated for a frank acknowledgement of the risk profile of surgery for ICC. Benchmark rates of 4.8% mortality and 14% severe complication have been proposed which reflect the challenge of caring for patients with ICC. However, there is significant variation in outcomes between individual units including one unit which has a 40% major complication rate and a mortality rate estimated at more than ten percent from figure two. The participating institutions in this study are all high-volume centres but it is important to realise that there are no specific inclusion criteria- in this and many other such studies- for units to propose their outcomes as the “reference standard.” The reader is thus advised to evaluate these results in the context of their own clinical practice and case-mix. Similarly, there is an expected wide variation in length of stay which likely reflects cultural differences and is probably a less important outcome measure to evaluate performance.

Benchmarking of surgical outcomes allows concrete endpoints to be proposed. Although the literature largely stratifies these by operation type, this study provides a nuanced look at hepatectomy for a complex malignancy that is often a rarer indication for surgery in most institutions. It provides

the granular detail in measurable outcomes so that surgeons and institutions can focus on the processes to achieve these.

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