

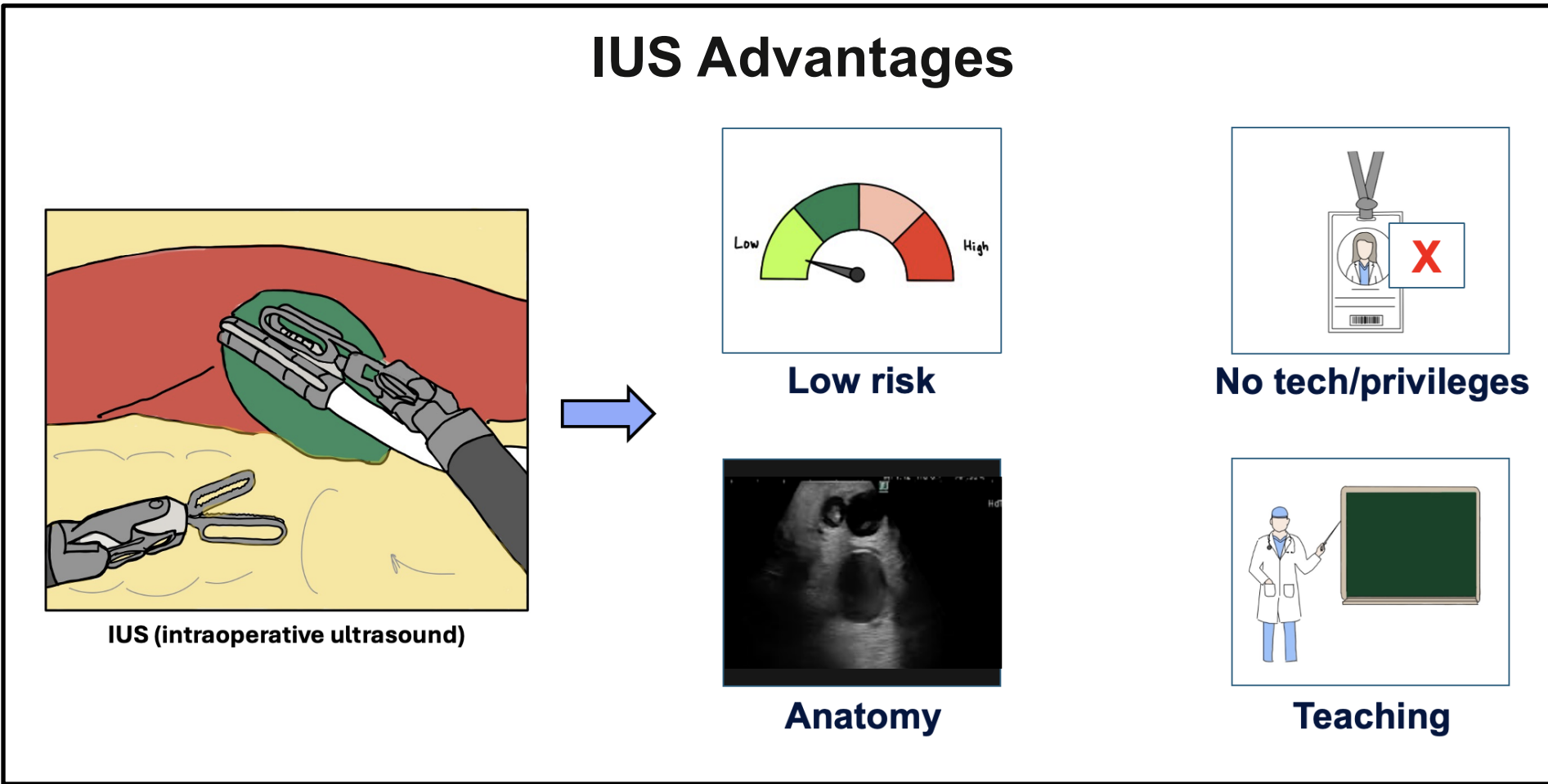
Systematically improving confidence in anatomy and identifying choledocholithiasis during acute cholecystectomy with Intraoperative Ultrasound (IUS): A Quality Improvement Initiative

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Background

- The Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) guidelines on routine biliary imaging during cholecystectomy recognize intraoperative ultrasound (IUS) as equivalent to intraoperative cholangiography (IOC).
- IUS is underutilized in cholecystectomy secondary to lack of exposure and training. It can detect choledocholithiasis and biliary difficult biliary anatomy.



Objective

Implement a quality improvement (QI) initiative to systematically increase surgical trainee exposure to and confidence in biliary IUS during cholecystectomy

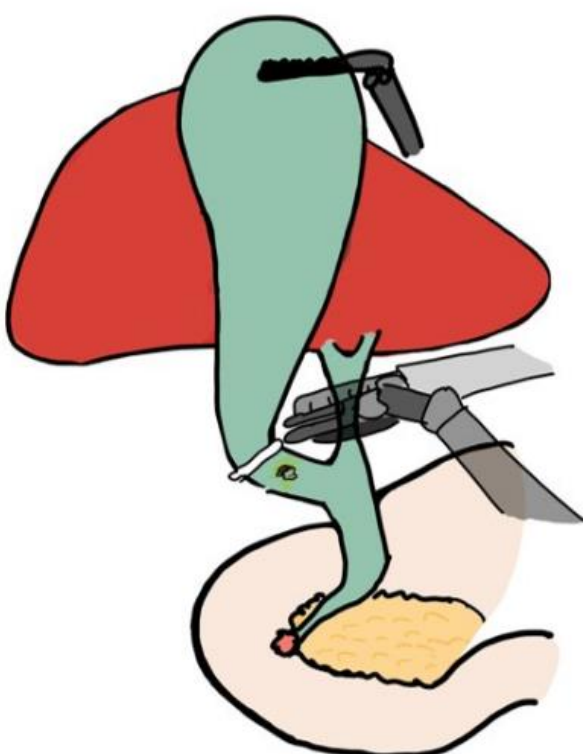
Methods

Single institution, community teaching hospital

Trainees provided with lectures and hands-on learning

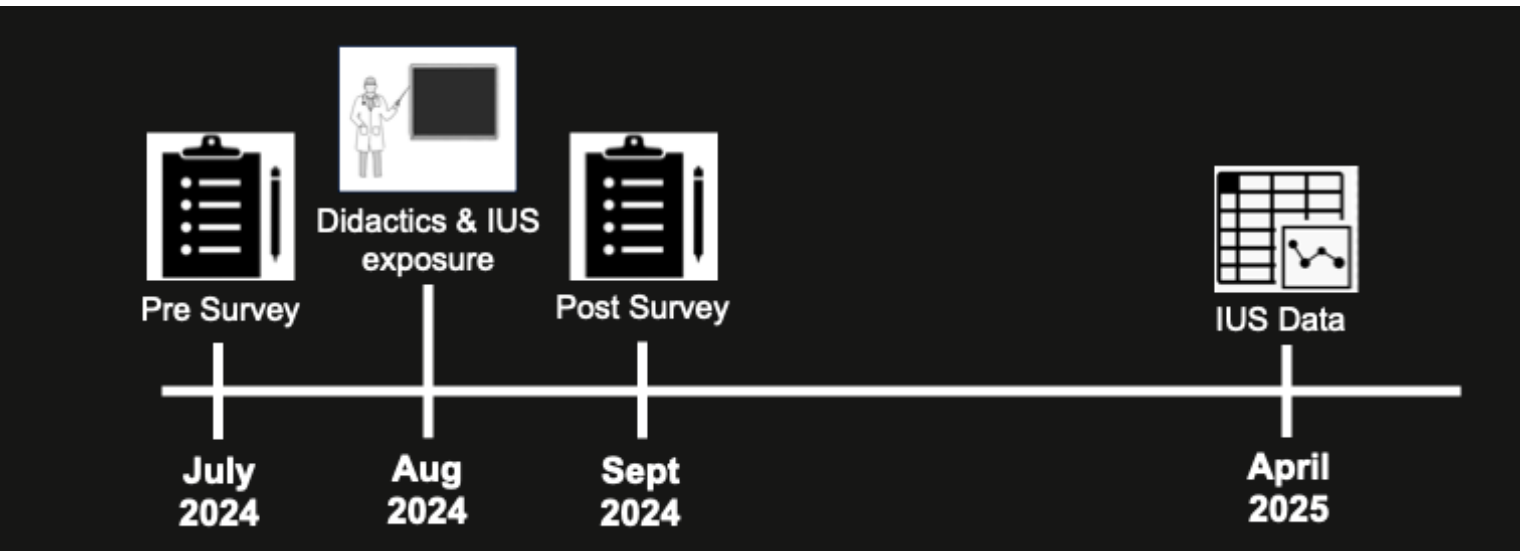
Surveys (pre/post) administered to assess knowledge of porta hepatis anatomy and confidence

- Routine IUS was performed on inpatient cholecystectomies for acute cholecystitis
- IUS of the liver, gallbladder and porta hepatis using a robotic small transducer from Fujifilm® (Tokyo, Japan) via a picture-in-picture display for 1 year.



Methods

- Fisher’s exact test was used to compare results.



Have you ever seen/performed an intraoperative US of the porta hepatis? Yes No

The picture below is a representation of the main structures within the porta hepatis in 2-dimensional space. Circles closer to the top of the page are more anterior in the body (towards abdominal wall/away from spine) and to the right of the page are more medial.

Please select the correct answer (1-6) that anatomically matches the circles in the order of A, B, C.

Anterior ↑

Medial →

	A	B	C
1	Common hepatic artery	Portal vein	Common bile duct
2	Common bile duct	Common hepatic artery	Portal vein
3	Common hepatic duct	Portal vein	Common hepatic artery
4	Common hepatic artery	Common bile duct	Portal vein
5	Common bile duct	Portal vein	Common hepatic artery
6	Common hepatic duct	Common hepatic artery	Portal vein

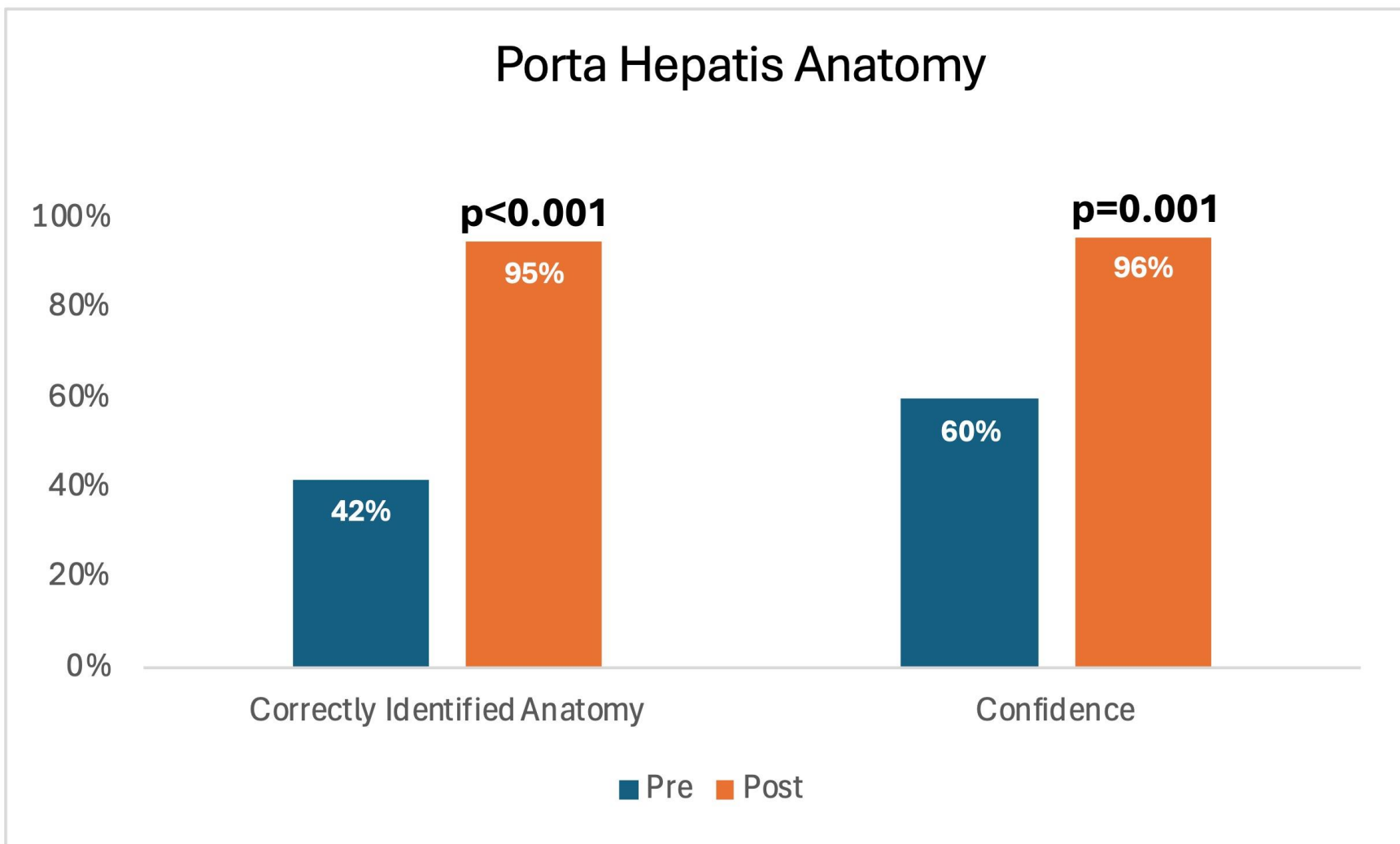
On a scale of 1-5, please rate the level of confidence in your answer choice above:

1 – Completely unsure
2 – Somewhat unsure
3 – Neutral – could be right could be wrong
4 – Somewhat confident
5 – Completely confident

Results

- 65% (90/138) of eligible patients underwent IUS. Reasons for not performing IUS included unavailable equipment, lack of trained staff, and surgeon discretion.
- During the QI period 40 patients (29%) were identified with choledocholithiasis on IUS who then underwent successful cholecystectomy with common bile duct exploration.
- 26% (5/19) of residents had seen an IUS previously
- There was a significant improvement in both anatomy identification and confidence

Results (Cont.)



Summary

In 1 year, 19 surgical trainees were exposed to biliary IUS and accurate identification of porta hepatis anatomy improved from 42 to 95% (p<0.001). Simultaneously, confidence in identifying porta hepatis anatomy significantly improved from 60 to 96% (p=0.001).

Conclusion

This QI initiative significantly improved resident competency and confidence with IUS during cholecystectomy and highlight the clinical utility of IUS in detecting choledocholithiasis. These findings support the potential for IUS to become a standard modality in biliary tree imaging during cholecystectomy.

References

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