Conscious sedation vs. general anesthesia during surgeon-performed ERCP: 10-year review

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Introduction: Sedation for endoscopic procedures aims to optimize patient comfort and safety. Historically, ERCP was performed under conscious sedation. While there is no standard of care for method of anesthesia, ERCP is a complex endoscopic procedure that usually requires more time to perform safely. Inadequate sedation during ERCP may lead to longer procedure times, decreased technical success, and increased adverse events.

Methods: Retrospective review of adult and pediatric ERCP performed by three fellowship-trained flexible endoscopy surgeons at Jackson Memorial Hospital, an academic tertiary care center in the US, between August 2012 and August 2022. Inclusion criteria included inpatients and outpatients, who underwent a completed or attempted ERCP by these surgeons during that period. Data collected included demographic data, indications for the procedure, procedure-specific data and 30-day complications. All analyses were performed using SAS, version 9.4

Results: 1318 cases were performed during the study period. 87.2% were adults, mean age was 46.7 years and 62.6% had no prior ERCP. The most common indications were choledocholithiasis and liver transplant-related complications. Mean procedure duration was 36.6 minutes. Overall, 1115 (84.5%) were performed under general anesthesia and the remaining ones under conscious sedation. In the pediatric population, only 1 ERCP was performed under conscious sedation. Meperidine and midazolam were the most common medications used for conscious sedation. After 2015, the majority of ERCP were done under general anesthesia, with only 10 ERCP performed under conscious sedation since then. Table 1 shows that on multivariate analysis, use of general anesthesia and some interventions were associated with increased procedure duration, while pediatric cases were associated with shorter procedure time. Type of anesthesia was no associated with difference in ERCP complications.

Conclusion: General anesthesia became consistently available at our institution for ERCP in 2015 and since then, there was a transition to general anesthesia. We demonstrate that ERCP is a safe procedure, whether performed under conscious sedation or general anesthesia, with high success rate, when performed by fellowship-trained surgeons at an academic center.

Table 1. Adjusted Associations of Clinical and Procedural Characteristics with ERCP Duration

	Beta Coefficient (95% CI)	Test statistic*	p-Value
Omnibus F-test (F (ndf, ddf), p-value)		12.82 (19, 1294)	<0.0001
Age (per year increase)	0.11 (0.05, 0.17)	3.47	0.0005
Pediatric (Y vs N)	-0.26 (-3.89, 3.37)	-0.14	0.8898
Gender (F vs M)	-0.64 (-2.57, 1.29)	-0.65	0.5141
Previous ERCP (Y vs N)	0.29 (-2.90, 3.49)	0.18	0.8581
Indication for ERCP			
Choledocholithiasis (Y vs N)	2.92 (-0.31, 6.15)	1.77	0.0761
Stricture/leak post OLT (Y vs N)	0.80 (-2.56, 4.17)	0.47	0.6394
Malignancy (Y vs N)	-2.42 (-6.84, 1.99)	-1.08	0.2814
Mirizzi syndrome (Y vs N)	6.12 (-7.70, 19.94)	0.87	0.3853
Cholangitis (Y vs N)	-9.19 (-42.41, 24.02)	-0.54	0.5871
Post-op leak (Y vs N)	-0.63 (-5.06, 3.80)	-0.28	0.7806
Anesthesia (General vs Sedation)	5.35 (2.75, 7.95)	4.04	<0.0001
Procedure performed			
Sphincterotomy (Y vs N)	0.85 (-2.83, 4.54)	0.45	0.6497
Stone removal (Y vs N)	-0.44 (-2.49, 1.61)	-0.42	0.6753
Stricture dilation (Y vs N)	4.74 (0.67, 8.80)	2.29	0.0223
Brushings (Y vs N)	4.40 (-0.39, 9.20)	1.80	0.0717
Stent insertion (Y vs N)	4.48 (1.00, 7.96)	2.52	0.0118
Double wire (Y vs N)	5.16 (1.87, 8.45)	3.08	0.0021
Spyglass (Y vs N)	28.81 (20.75, 36.86)	7.01	<0.0001
# of interventions (per intervention increase)	1.05 (-1.45, 3.55)	0.82	0.4117

*t value

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