

No	Study	Year published	Country	Design	Group	Number	Mean Age	Size of stone	Success rate	Complications (Clavien Dindo score)	Retained/recurrent stone	LOS (days)	Hospitalisation bill	Mortality
1	Shuang Liu	2020	China	RCT	CBDE/Cholecystectomy	104	56.9	1.1 ± 0.4 cm	93.3%	18% 2 pancreatitis 2 bile leak 16 others all conservatively managed All CD 1 or 2	5.20%	4 (2–9)	18000 ± 2300 RMB	0%
					ERCP/Cholecystectomy	103	57.1	1.2 ± 0.3 cm	82.50%	30% 21 pancreatitis 4 bleeding 5 Cholangitis 11 Others 2 CD 4 , rest not stated	17.60%	6 (2–91)	29000 ± 4100 RMB	0%
2	Victor Vakayil	2019	USA	Retrospective	CBDE/Cholecystectomy	1185	51.1	Not stated	Not stated	CD 1 - 0.7% (8) CD 2 - 4.4% (52) CD 3 - 2.4% (29) CD 4 - 3.2% (38) CD 5 - 0.8% (9) No mention on type of complications	Not stated	3 [1–5]	NA	0.80%
					ERCP/Cholecystectomy	629	51.3	Not stated	Not stated	CD 1 - 0.8% (5) CD 2 - 5.4% (34) CD 3 - 3.0% (19) CD 4 - 2.4% (15) CD 5 - 0.2% (1)	Not stated	3 [2–5]	NA	0.20%
3	B. R. Poh	2016	Australia	RCT	CBDE/Cholecystectomy	52	53.4	6.5(3.2)mm	69%	20 (38%) Pancreatitis 2 Bleed 1 Bile leak 2 Wound complications 2 Pneumonia 2 Others 4 CD score 3 and above - 11 (21%)	42%	3 (2–4)	NA	0%
					ERCP/Cholecystectomy	52	53.9	7.3 (3.1) mm	87%	14 (27%) Pancreatitis 4 Bleed 4 Others 5 CD score 3 and above - 5 (10%)	15%	2 (2–3)	NA	0%
4	Bora Koc	2013	Turkey	RCT	CBDE/Cholecystectomy	57	51.5	Not stated	96.5% (did not state numbers)	4 patients 2 bile leak 2 retained stones CD 1 - 2 patients CD 3a - 2 patients	3.50%	3	Nil	0%
					ERCP/Cholecystectomy	54	54.9	Not stated	94.4% (numbers not stated)	6 patients 1 duodenal perf, 2 pancreatitis, 3 retained stones CD 2 - 2 patients CD 3a - 3 patients CD 3b - 1 patient	5.55%	6	NA	0%
					CBDE/Cholecystectomy	84	45.1	Not stated	91.70%	23.8% CD 1 - 23.8% SSI - 7.1% Bile leak - 16.7%	3.60%	4.6 ± 2.4 (2–15)	394.1 ± 133.1 USD (242.9–879.5)	0%

5	Virinder Kumar Bansal	2014	India	RCT	ERCP/Cholecystectomy	84	43	Not stated	88.10%	22.6% CD 1 - 9.5% CD 2 - 2.4% CD 3a - 2.4% CD 3b - 3.6% CD 4b - 1.2% CD 5 - 3.6% SSI 7.1% Bile leak 2.4% Bleeding 3.6% Pancreatitis 3.6% Duodenal perf 2.4%	0%	5.3 ± 6.2 (2-37)	506.5 ± 235.3 USD (273.5-164 7.1)	3.60%
6	Yong Yan	2021	China	Retrospective	CBDE/Cholecystectomy	28	65	10± 4mm	96.40%	10.8% (3 patients) CD 2 - 7.2% (2) CD 3 - 3.6% (1) 1 bile leak 2 SSIs	0%	12±5	45956.7 ±10524.6 RMB	0%
					ERCP/Cholecystectomy	32	67	8±3mm	93.80%	9.4% (3) CD 2 - 9.4% (3) 2 pancreatitis 1 SSI	0%	11±4	52162.2± 12059.3 RMB	0%
7	Qi Zou	2022	China	RCT	CBDE/Cholecystectomy	40	64.9	12.8 ±3.6mm	97.50%	7/40 CD 2 - 6 patients CD 3a - 1 patient 5 bile leak 1 bleed 1 retained stone	2.50%	8.76 ±1.91	27420 ±6500 RMB	0%
					ERCP/Cholecystectomy	40	67.8	12.1 ±4.1mm	95%	16/40 CD 2 - 13 patients CD 3a - 3 patients 7 pancreatitis 6 bleed 3 retained stone	7.50%	9.59 ±3.78	37570 ± 6040 RMB	0%
8	Mahmoud Rady	2019	Egypt	RCT	CBDE/Cholecystectomy	25	47.24	0.91 ±0.072cm	80%	8% (breakdown not provided)	4%	4.440±0.7 98	NA	0%
					ERCP/Cholecystectomy	25	44.76	1.08±0.072cm	84%	16% (breakdown not provided)	0%	4.920±0.7 72	NA	0%
9	Guoxin Guan	2018	China	Retrospective	CBDE/Cholecystectomy	68	52	Not stated	100%	19 out of 68 CD 2 - 13 CD 3a - 6 patients 13 bile leak 6 SSIs	0%	4.1	NA	0%
					ERCP/Cholecystectomy	60	47	Not stated	75%	24 out of 60 CD 2 - 24 patients 4 bile leak 6 SSIs 6 cholangitis 8 pancreatitis	0%	8.4	NA	0%
10	Seung Jae Lee	2022	Korea	Retrospective	CBDE/Cholecystectomy	46	84.1	11.9 ± 7.9mm	91.30%	17.4% (8/46) CD score ≥ 3 - 8.7% (4/46) 3 bileleak 1 pleural effusion 2 pneumonia 2 ileus	4.30%	12.7 ± 6.7	NA	0%
					ERCP/Cholecystectomy	91	83.5	6.0 ± 4.1mm	95.60%	11% (10/91) CD score ≥ 3 - 3.3% (3/91) 1 bile leak 2 pleural effusion 2 pneumonia 4 fluid collection 1 retention of urine	8.80%	11.7 ± 5.2	NA	0%

11	Xiaohong Wang	2017	China	Retrospective	CBDE/Cholecystectomy	54	59.5	1.19±0.59cm	87.00%	6(11.1%) 3 biliary infection, 2 benign stricture, 1 postop Intestinal Obstruction 2 patients CD 3 and above	Not stated	Not stated	Not stated	0%
					ERCP/Cholecystectomy	87	57.3	1.08±0.55cm	97.70%	3(3.4%) All post ERCP Pancreatitis, all CD 1 and 2	Not stated	Not stated	Not stated	0%
12	Renjie Zhang	2022	China	Retrospective	CBDE/Cholecystectomy	43	63	1.33 ± 0.60cm	97.70%	Total 7.0% (3/43) Biliary infection 4.7% (2/43) Bile leakage 2.3% (1/43) All below CD 3	4.70%	13.70 ± 4.30	33730.19 RMB	0%
					ERCP/Cholecystectomy	46	60	1.11 ± 0.43cm	95.70%	Total 32.6% (15/46) Biliary infection 19.6% (9/46) Pancreatitis 19.6% (9/46) Sepsis 4.3% (2/46) All below CD 3	15.20%	10.76 ± 4.82	32701.89 RMB	0%
13	Mohammed H. Al-Temimi	2017	USA	Retrospective	CBDE/Cholecystectomy	105	50.6	Not stated	89.50%	All: 6 (5.7%) CD 3 and above: 2 (1.9%)	0.95%	3.5 ± 2.4	NA	0%
					ERCP/Cholecystectomy	195	45.8	Not stated	98%	All 15 (7.7%) CD 3 and above 10 (5.1%)	1.50%	3.4 ± 2.6	NA	0%
14	Wen-Chao Zhao	2017	China	Retrospective	CBDE/Cholecystectomy	49	56.52	1.4±0.69	100%	1 case of bile leak- CD 3 and above	Not stated	4.00±0.79 3	NA	0%
					ERCP/Cholecystectomy	63	66.5	1.2±0.75cm	96%	14.3% - all post ERCP pancreatitis All below CD 3	Not stated	2.75±0.59 5	NA	0%
15	Javier Ernesto Barreras González	2016	Cuba	RCT	CBDE/Cholecystectomy	100	56.3	Number not stated Size 7.7 (4 –	97.70%	2/43 (4.7%) 2 bile leak All below CD 3	2.30%	2.1 days	NA	0%
					ERCP/Cholecystectomy	Preop ERCP - 101 Intraop ERCP - 99	Preop ERCP - 57.7 (20 – 84) Intraop ERCP - 58.4 (23 – 87)	Number not stated Size Preop ERCP 8.4 (5 – 12)mm Intraop ERCP 8.2 (4 – 20)mm	Preop ERCP - 42/45 (93.3%) Intraop ercp - 45/46 (97.8%)	Preop ERCP - 6/45 (13.3%) 5 cholecystitis, 1 pancreatitis All below CD 3 Intraop ERCP - 0%	Preop ERCP - 5/45 (11.1%) Intraop ERCP - 1/46 (2.2%)	Preop ERCP - 3.1days Intraop ERCP - 1.2 days	NA	0%
16	Xiao-Dong Zhou	2019	China	Retrospective	CBDE/Cholecystectomy	88	58.4	1.2 ± 0.6cm	97.70%	9/88 (10.2%) Bleeding 4/88 (4.5%) Cholangitis 1/88 (1.1%) Bile leak 2/88 (2.3%) Wound infection 2/88 (2.3%) Did not state CD score	17%	9 (8-12)	17800 (14300-21500) RMB	10.20%
					ERCP/Cholecystectomy	88	58.6	1.2 ± 0.5cm	87.50%	9/88 (10.2%) Bleeding 1/88 (1.1%) Pancreatitis 3 (3.4%) Hyperamylasemia 4/88 (4.5%) Cholangitis 1/88 (1.1%) Did not state CD score	20.50%	6.5 (5-9.3)	18000 (15900-21400) RMB	11.40%

17	Moharram A. Mohamed	2015	Egypt	RCT	CBDE/Cholecystectomy	75	47.1	Not stated	92%	Bile leak 2/60 (2.7%) cholangitis 2/60 (2.7%) pancreatitis 1/60 (1.3%) All below CD 3	Not stated	2 ± 0.53	NA	0%
					ERCP/Cholecystectomy	75	39.07	Not stated	96%	Cholangitis 2/60 (2.7%) Pancreatitis 4/60 (5.3%) All below CD3	Not stated	2 ± 0.57	NA	0%
18	Jiong Lu	2013	China	Retrospective	CBDE/Cholecystectomy	88	49.5	0.9 ± 0.5cm	93.20%	9 (10.2%) Bile leak - 3 (3.4%) Pancreatitis 1 (1.1%) Pleural effusion 1 (1.1%) Pneumonia 2 (2.3%) T tube displacement 2 (2.3%) 1 CD 3 and above, rest below CD 3	1.10%	5.1 ± 2.5	3473.1 ± 1116.3 USD	0%
					ERCP/Cholecystectomy	122	52.1	0.7 ± 0.4	95.10%	19 (15.6%) Pancreatitis 10 (8.2%) Bleeding 3 (2.5%) Perforation 1 (0.8%) Cholangitis 2 (1.6%) Pneumonia 2 (1.6%) Multi-organ failure 1 (0.8%) 1 CD3 and above, rest all below CD3	2.50%	7.9 ± 3.9	4157.8 ± 1106.0 USD	1.60%
19	Eryk Naumowicz	2014	Poland	RCT	CBDE/Cholecystectomy	LCBDE - 35 Open - 23	LCBDE - 58.3 (23-81) Open - 63.2 (31-88)	open CBDE: 11.8 (9-25)mm LCBDE: 11.1 (8-18)mm	LCBDE - 80% (28/35) Open - 95.7% (22/23)	LCBDE - CD 2 - 2 CD 3 - 1 Open - CD 2 - 6 CD 3 - 1	LCBDE - 2 (6.7%) Open - 1 (3.6%)	LCBDE - 7.1 (4-16) Open - 10.6 (7-15)	NA	0%
					ERCP/Cholecystectomy	42	61.3	10.6 (7-18)	76.20%	CD 2 - 8/42	13.50%	5.2 (3-12)	NA	0%
20	Guoqian Ding	2014	China	RCT	CBDE/Cholecystectomy	110	58.42	0.98±0.24cm	93.64%	4 (3.63 %) 2 bile leak 2 wound infection No mention of CD score	2.06%	Not stated	NA	0%
					ERCP/Cholecystectomy	111	57.53	0.99±0.27cm	94.59%	6 (5.1 %) 2 wound infection 1 bleeding 3 post ERCP pancreatitis No mention of CD score	9.47%	Not stated	NA	0%
21	Yong Zhou	2017	China	Prospective	CBDE/Cholecystectomy	Transcystic 63 Transductal 46	Transcystic - 62.5±13.4 Transductal - 64.1±11.9	Not stated	Transcystic - 93.7% Transductal - 100%	Transcystic 2 bile leak Transductal 4 bile leak CD score not stated	Transcystic 2 Transductal 2	Transcystic 4.0 ± 1.0 Transductal 6.4±1.9	NA	0%

21	Tong Zhiou	2017	China	Prospective	ERCP/Cholecystectomy	52	65.4	Not stated	92.30%	2 Duodenal perforation 2 bile leak 1 hemorrhage 2 pancreatitis CD score not stated	7.69%	4.2±1.2	NA	1.90%
22	Anh N. Vu	2021	Australia	Retrospective	CBDE/Cholecystectomy	204	48	Not stated	82%	CD 2 - 2 patients CD 3a - 1 patient CD 3b - 4 patient	0%	4	NA	0%
					ERCP/Cholecystectomy	403	63	Not stated	97%	CD 2 - 6 patients CD 3a - 4 patients CD 3b - 14 patients CD 4a - 1 patient CD 4b - 3 patients	5.70%	7	NA	0.70%
23	Ballou	2019	US	Retrospective	CBDE/Cholecystectomy	89	48	Not stated	67%	16% (n=14) had clavien dindo 3 or higher complication	Not stated	3.1	44412 USD	Not stated
					ERCP/Cholecystectomy	68	36.5	Not stated	97%	CD 3 and above - 6% (4 patients) Type of complication not stated	2.90%	4.4	51353 USD	Not stated
24	Gilsdorf	2015	US	Retrospective	CBDE/Cholecystectomy	555	45.1	Not stated	63%	3.1% NSQIP complications	Not stated	2.2	9000USD	1.30%
					ERCP/Cholecystectomy	Preop ERCP - 379 Postop ERCP - 1027	preop ERCP - 54.2 Postop ERCP - 47.6	Not stated	Preop ERCP - 78% Postop ERCP - 88%	Preop ERCP - 6.9% NSQIP complications Postop ERCP - 4.6%	Not stated	Preop ERCP 4.3 Postop ERCP 3.2 days	PreopERCP - 14200USD Postop ERCP 10800USD	Preop ERCP - 1.9% Postop ERCP - 1.0%
25	Yong Z	2018	China	Retrospective	CBDE/Cholecystectomy	54	83.39	Not stated	100%	11.1% bile leak, 1.9% T tube related pain, 1.9% T tube related peritonitis All below CD 3	3.70%	6.2	Not stated	0%
					ERCP/Cholecystectomy	46	84.24	Not stated	89.10%	2.1% duodenal perforation, 8.4% adverse reaction to sedation, 4.2% pancreatitis, 2.1% haemorrhage 2.1% CD 3 and above	4.20%	6	Not stated	2.10%
26	Tong G	2022	China	Retrospective	CBDE/Cholecystectomy	280	52.11	0.82cm	99.30%	1.1% (n=3 - bile leak) All below CD3	0.70%	6.92	Not stated	0%
					ERCP/Cholecystectomy	275	51.79	0.82 cm	97.50%	3.6% (N=10 - 4 pancreatitis, 3 post ERCP BGIT, 3 cholangitis) 1 CD3 and above, rest below	4%	14.16	Not stated	2.10%
27	Garza et al.	2024	Mexico	Ambispective cohort	CBDE/Cholecystectomy	35	28 (18–86)	Not stated	62.90%	0	5.70%	2 (1–8)	Not stated	0%
					ERCP/Cholecystectomy	39	30 (18–88)	Not stated	79.50%	5 (CD II)	12.80%	1 (1–6)	Not stated	0%
28	Wu et al.	2024	Taiwan	Retrospective (≥70 yr)	CBDE/Cholecystectomy	80	80.6 ± 6.9	Not stated	92.50%	CD ≥III: 4	13.80%	8.09 ± 3.30	Not stated	1.30%
					ERCP/Cholecystectomy	80	77.6 ± 6.0	Not stated	95.00%	CD ≥III: 3	12.50%	13.53 ± 5.84	Not stated	0%
29	Han et al.	2024	China	Retrospective (male-only)	CBDE/Cholecystectomy	50	44.6 ± 8.9	Not stated	84.00%	9/50 (18.0%)	18%	8.76 ± 2.32	Not stated	Not stated
					ERCP/Cholecystectomy	50	43.3 ± 8.3	Not stated	98.00%	3/50 (6.0%)	2%	5.31 ± 2.37	Not stated	Not stated
30	Sun et al.	2024	China	Retrospective	CBDE/Cholecystectomy	74	52.2 ± 9.2	Not stated	97.30%	NR	13.50%	7.7 ± 3.3	19 ± 1k RMB	0%
					ERCP/Cholecystectomy	74	53.5 ± 9.4	Not stated	94.60%	NR	17.60%	9.3 ± 3.1	26 ± 2k RMB	0%
31	Hainong et al.	2025	India	Prospective	CBDE/Cholecystectomy	36	39.3 ± 11.2	1.75 ± 0.92 cm	88.90%	2 bile leaks	11.10%	NR	Not stated	0%

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