

# Cap-Assisted endoscopy for esophageal foreign bodies: A meta-analysis

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#### Introduction

Cap-assisted endoscopy has gained popularity as an alternative to the conventional endoscopy techniques of pushing to the stomach or piecemeal removal via the mouth of esophageal foreign bodies. We investigated the effectiveness of cap-assisted endoscopy with conventional endoscopy.

## Methods

We reviewed several databases from inception to

December 2021 to extract studies that compared the
effectiveness of cap-assisted endoscopy to
conventional endoscopy for removal of esophageal
foreign body. Our outcomes of interest were
procedure time, time of foreign body retrieval,
technical success of the procedure, adverse event
rate, and en bloc removal of foreign body. Analysis
was performed by calculating odds ratio or mean
difference using the random effects model.

### Results

Six studies were included in our meta-analysis (n=1305). Cap-assisted endoscopy demonstrated higher odds of technical success (odds ratio [OR] 3.23; 95% CI: 1.53-6.81; p=0.002), and en bloc removal (OR 26.23; 95% CI: 17.41-39.52; p< 0.01) as compared to conventional techniques. Furthermore, cap-assisted endoscopy showed decreased odds of adverse events (OR 0.22; 95% CI: 0.06-0.81; p=0.02) and mean time of foreign body removal (Mean difference (MD) -11.8 minutes; 95% CI: -18.64 to -4.95; p< 0.01) as compared to conventional techniques.

#### Discussion

Cap-assisted endoscopy has higher rates of technical success and en bloc removal with reduction in adverse events and time taken for foreign body retrieval as compared to conventional techniques.

Cap-assisted endoscopy should be considered as a potential first-line option for impacted esophageal foreign bodies.

**Figure 1:** Forest plot showing the technical success of cap-assisted endoscopy versus conventional endoscopy for esophageal FB removal.

	Cap-Assisted		Conventional		Odds Ratio			Odds Ratio		
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI		M-H, Rando	m, 95% CI	
Fang et al 2020	224	224	222	224	6.0%	5.04 [0.24, 105.68]			-	
Ooi et al 2018	93	93	103	106	6.3%	6.32 [0.32, 124.05]		-	<del></del>	<b></b>
Ooi et al 2021	170	171	160	171	13.1%	11.69 [1.49, 91.56]				
Wahba et al 2019	99	106	95	110	63.0%	2.23 [0.87, 5.72]		+		
Zhang et al 2010	7	7	21	23	5.6%	1.74 [0.07, 40.62]			•	_
Zhang et al 2013	35	35	33	35	5.9%	5.30 [0.25, 114.47]				<b>→</b>
Total (95% CI)		636		669	100.0%	3.23 [1.53, 6.81]				
Total events	628		634							
Heterogeneity: Tau <sup>2</sup> = 0.00; Chi <sup>2</sup> = 2.74, df = 5 (P = 0.74); $I^2$ = 0%								0.1	<del></del>	100
Test for overall effect: $Z = 3.08$ (P = 0.002)								Favors Conventional	· <del>-</del>	

**Figure 2:** Forest plot showing the foreign body retrieval time of cap-assisted endoscopy versus conventional endoscopy for esophageal foreign body removal.

	Cap-Assisted		Conventional		Mean Difference			Mean Difference				
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, Random, 95% CI		
Ooi et al 2018	34.3	8	93	43.3	22.6	106	30.2%	-9.00 [-13.60, -4.40]				
Ooi et al 2021	4.5	0.5	171	21.7	0.9	171	35.0%	-17.20 [-17.35, -17.05]				
Wahba et al 2019	6.9	3.5	106	15.7	4.1	110	34.7%	-8.80 [-9.82, -7.78]				
Total (95% CI)			370			387	100.0%	-11.80 [-18.65, -4.95]		•		
Heterogeneity: Tau <sup>2</sup> = 34.90; Chi <sup>2</sup> = 268.61, df = 2 (P < 0.00001); $I^2$ = 99% Test for overall effect: $Z$ = 3.38 (P = 0.0007)									-100	-50 Favors Cap-Assisted	50 Favors Conventional	100

## Contact

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