SUPPLEMENTARY MATERIALS

CLINICAL EFFICACY AND SAFETY OF PALLIATIVE ESOPHAGEAL STENTING WITHOUT FLUOROSCOPY - A SYSTEMATIC REVIEW & META-ANALYSIS

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SUPPLEMENTARY MATERIALS LEGEND

Supplementary Fig. S1 Forest plot, stent migration.

Supplementary Fig. S2 Forest plot, tumor overgrowth.

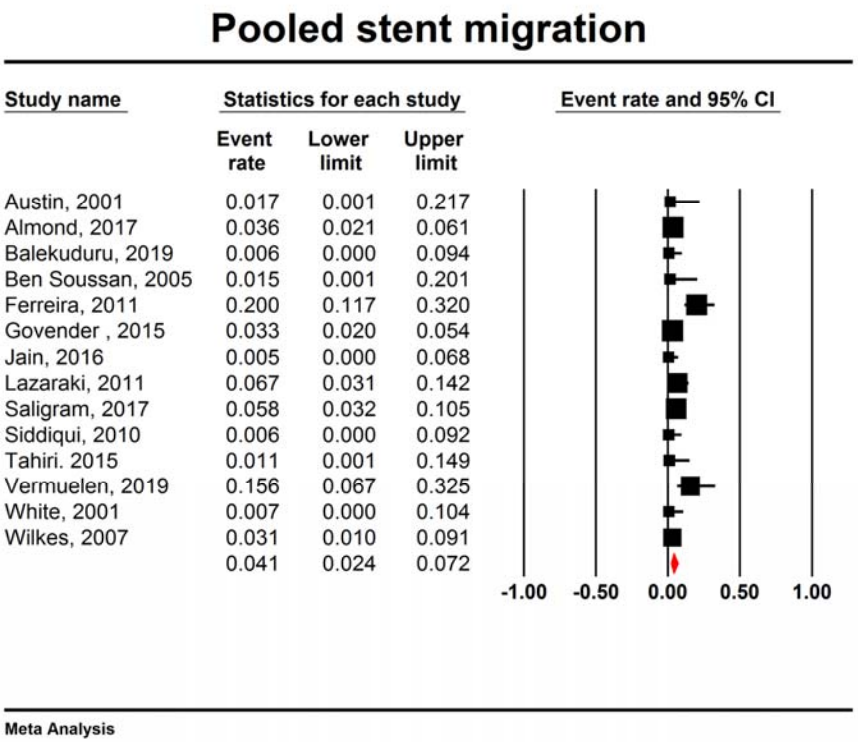
Supplementary Fig. S3 Forest plot, perforation.

Supplementary Fig. S4 Funnel plot for publication bias.

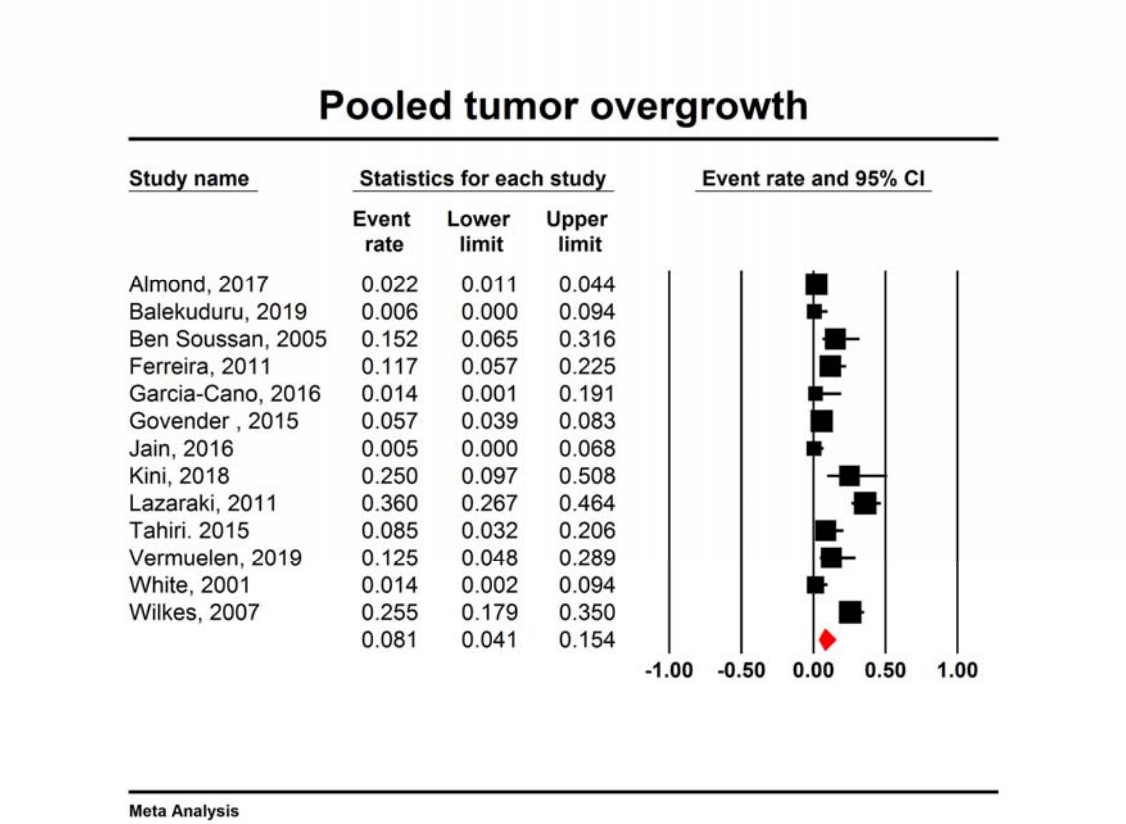
Appendix A Literature search strategy.

Appendix B MOOSE checklist.

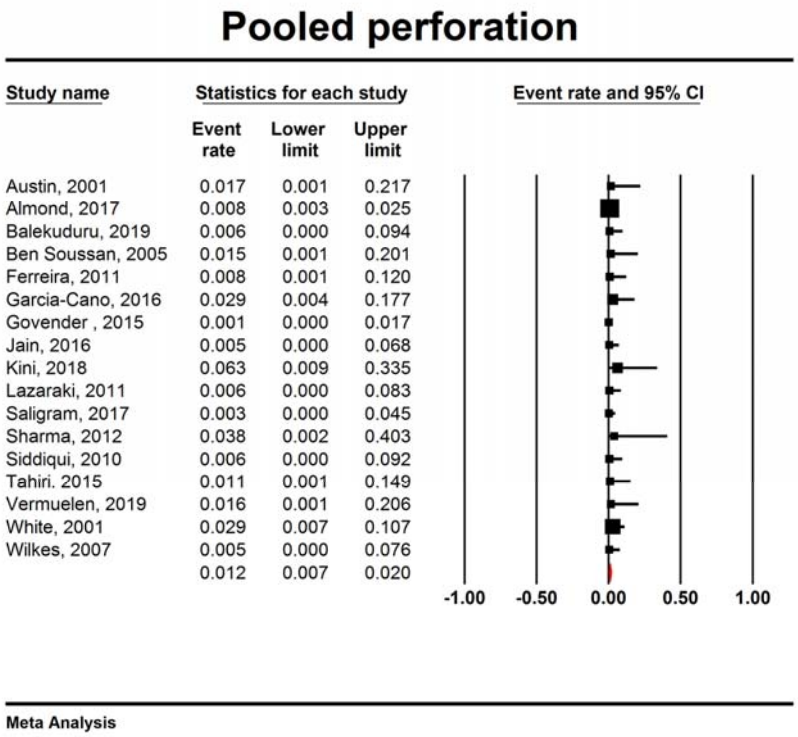
Supplementary Fig. S1 Forest plot, stent migration.



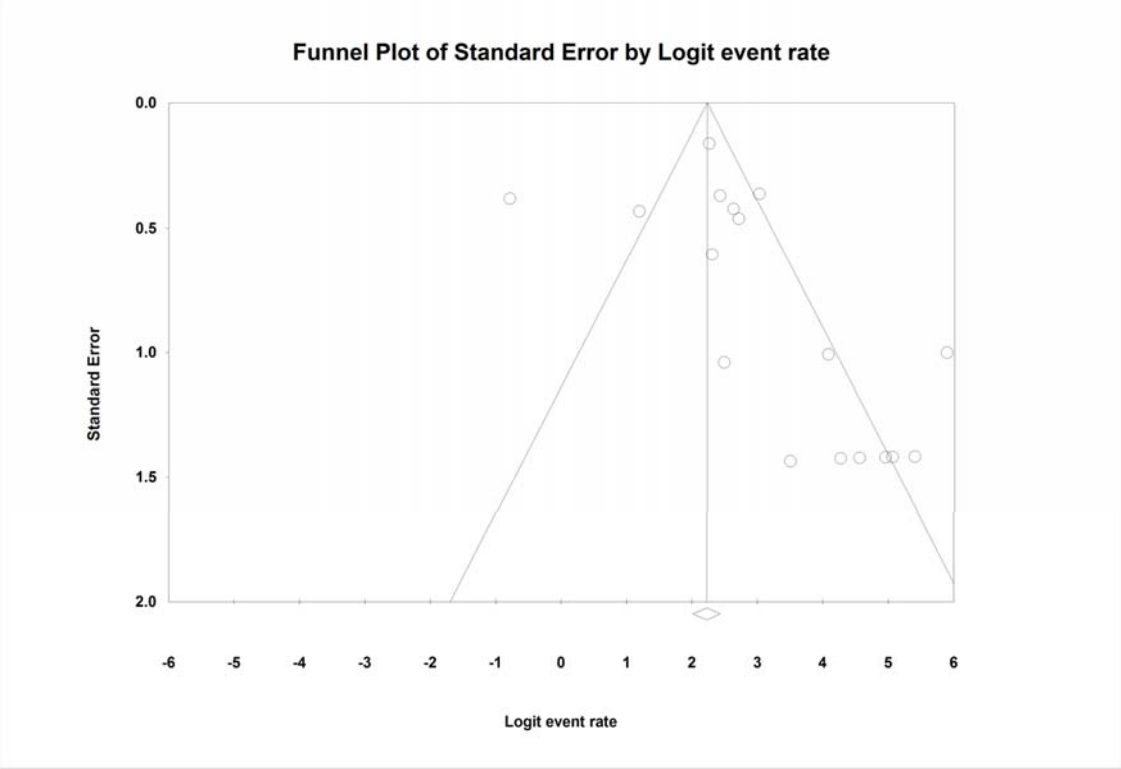
Supplementary Fig. S2 Forest plot, tumor overgrowth.



Supplementary Fig. S3 Forest plot, perforation.



Supplementary Fig. S4 Funnel plot for publication bias.



Appendix A Literature search strategy.

Malignant-dysphagia* OR ((aphagopraxia* OR deglutition-disorder* OR dysphagia* OR swallowing-disorder*) AND (esophagus-cancer* OR esophagus-neoplam* OR esophageal-cancer* OR esophageal-neoplasm*))

AND

Esophag*

AND

Stent*

AND

Fluoroscop* OR direct-endoscopic-vis* OR direct-endoscopic-place* OR direct-endoscopic-control*

Malignant-dysphagia* OR ((aphagopraxia* OR deglutition-disorder* OR dysphagia* OR swallowing-disorder* OR 'dysphagia'/de) AND (esophagus-cancer* OR esophagus-neoplam* OR esophageal-cancer* OR esophageal-neoplasm* OR 'esophagus cancer'/exp))

AND

Esophag* OR 'esophagus disease'/exp OR 'esophagus'/exp

AND

Stent* OR 'esophageal stent'/exp

AND

Fluoroscop* OR 'fluoroscopy'/exp OR direct-endoscopic-vis* OR direct-endoscopic-place* OR direct-endoscopic-control*

Malignant-dysphagia* OR ((aphagopraxia* OR deglutition-disorder* OR dysphagia* OR swallowing-disorder* OR "Deglutition Disorders"[Mesh]) AND (esophagus-cancer* OR esophagus-neoplam* OR esophageal-cancer* OR esophageal-neoplasm* OR "Esophageal Neoplasms"[Mesh]))

AND

Esophag* OR "Esophagus"[Mesh]

AND

Stent* OR "Stents"[Mesh]

AND

Fluoroscop* OR "Fluoroscopy"[Mesh] OR direct-endoscopic-vis* OR direct-endoscopic-place* OR direct-endoscopic-control*

Appendix B MOOSE checklist.

From: Stroup DF, Berlin JA, Morton SC et al. for the Meta-analysis Of Observational Studies in Epidemiology (MOOSE) Group. Meta-analysis of Observational Studies in Epidemiology. A Proposal for Reporting. JAMA. 2000;283(15):2008-2012. doi: 10.1001/jama.283.15.2008

MOOSE (Meta-analyses Of Observational Studies in Epidemiology) Checklist

A reporting checklist for Authors, Editors, and Reviewers of Meta-analyses of Observational Studies. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Reporting Criteria	Reported (Yes/No)	Reported on Page No.
Reporting of Background		
Problem definition	Yes	4
Hypothesis statement	Yes	4
Description of Study Outcome(s)	Yes	6
Type of exposure or intervention used	Yes	5
Type of study design used	Yes	5
Study population	Yes	5
Reporting of Search Strategy		
Qualifications of searchers (eg, librarians and investigators)	Yes	12
Search strategy, including time period included in the synthesis and keywords	Yes	5
Effort to include all available studies, including contact with authors	Yes	5
Databases and registries searched	Yes	5
Search software used, name and version, including special features used (eg, explosion)	Yes	7
Use of hand searching (eg, reference lists of obtained articles)	Yes	5
List of citations located and those excluded, including justification	Yes	7
Method for addressing articles published in languages other than English	Yes	7
Method of handling abstracts and unpublished studies	Yes	5
Description of any contact with authors	Yes	5
Reporting of Methods		
Description of relevance or appropriateness of studies assembled for assessing the hypothesis to be tested	No	
Rationale for the selection and coding of data (eg, sound clinical principles or convenience)	No	
Documentation of how data were classified and coded (eg, multiple raters, blinding, and interrater reliability)	No	
Assessment of confounding (eg, comparability of cases and controls in studies where appropriate	No	

Reporting Criteria	Reported (Yes/No)	Reported on Page No.
Assessment of study quality, including blinding of quality assessors; stratification or regression on possible predictors of study results	Yes	6
Assessment of heterogeneity	Yes	8
Description of statistical methods (eg, complete description of fixed or random effects models, justification of whether the chosen models account for predictors of study results, dose-response models, or cumulative meta-analysis) in sufficient detail to be replicated	Yes	6
Provision of appropriate tables and graphics	Yes	18
Reporting of Results		
Table giving descriptive information for each study included	Yes	18
Results of sensitivity testing (eg, subgroup analysis)	Yes	18
Indication of statistical uncertainty of findings	Yes	18
Reporting of Discussion		
Quantitative assessment of bias (eg, publication bias)	Yes	9
Justification for exclusion (eg, exclusion of non–English-language citations)	No	
Assessment of quality of included studies	Yes	9
Reporting of Conclusions		
Consideration of alternative explanations for observed results	No	
Generalization of the conclusions (ie, appropriate for the data presented and within the domain of the literature review)	Yes	11
Guidelines for future research	Yes	12
Disclosure of funding source	Yes	2

▶ **Supplementary Table S1** Study and population characteristics.

Author	Study design	Insertion technique	Pre-Insertion Dilation	# Patients	# Stents	Technical success	Clinical success	Stent type	Stent length (cm)	Age (years)	M	F	Dysphagia duration	Dysphagia deverity				Obst length	Tumor location			Median survival (days)	Stent A/E				Proc Time	AE	
														None	Mild	Mod	Severe		U 1/3	M 1/3	L 1/3		Migration	Overgrowth	Perforation	Others		Early (<30 days)	Late (>30 days)
Austin, 2001	Single-center, prospective, NR, United Kingdom	Side-by-side	10 mm (Savory)	30	30	23/30	23/30 (4w)	Ultraflex (prox release)	9 n (7 cm), 12 n (10 cm), 2 n (15 cm)	72 (43–86)	21	9	NR	NR	NR	NR	NR	NR	NR	NR	NR	116 (16–231)	0	NR	0	–	NR	No major complications occurred (30 d)	–
Almond, 2017	Single-center, retrospective, 2003 and 2014, United Kingdom	Side-by-side	TTS (10–12 mm)	362	465	361/362	NR	NR	122 n (< 12 cm), 105 (12 cm), 72 n (> 12 cm)	76 (IQR 66–83)	252	110	NR	NR	NR	NR	NR	6 (5–90)	13	92	257	128	13	8	3	–	NR	49 deaths	–
Balekuduru, 2019	Multicenter (2), retrospective, 2014 to 2017, India.	Guidewire	11 mm (CRE)	78	83	78/78	52/61	Ultraflex	10,12,15 cm	64 ± 10.1	59	19	2 ± 1.6	0	6	11	61	5.94 ± 2.94	7	46	25	141 (41–360)	0	0	0	–	NR	58 RS pain, 9 resp distress, 2 asp pna	–
Ben Soussan, 2005	Single-center, prospective, Oct 2002 to Jun 2004, France.	Side-by-side	11 mm (Savory)	33	38	30/33	30/33 (48H)	Ultraflex	12 n (10 cm), 17n (12 cm), 9 n (15 cm)	68.2 (47–92)	22	11	NR	NR	NR	NR	NR	7.15 (2–12)	8	13	12	NR	0	5	0	–	NR	1 persistent GERD, 2 severe retrosternal pain, 1 death (PE), 1 food impaction, 1 esophago-respiratory fistula.	–
Ferreira, 2011	Single-center, retrospective, Jan 2005 to Jan 2010, Portugal.	Side-by-side	12 mm (Savory)	60	60	59/60	NR	Choostent, Hanarostent, Ultraflex, Wallstents	8 cm to 14 cm	61 (36–87)	45	15	NR	–	–	60n		5.6 (2–9)	9	27	24	106 (6–366)	12	7	0	–	NR	15 pain, 9 vomiting, 3 dysphagia, 2 hemorrage, 4 malposition/migration, 9 death	3 tumor ingrowth, 7 tumor overgrowth, 8 food impaction, 2 hemorrage, 4 fistulae, 15 esophagitis, 8 prosthesis migration
Garcia-Cano, 2016	Single-center, Spain	Side-by-side	8–10 mm (Savory)	35	35	35/35	NR	Ultraflex	20 n (10 cm), 11 n (12 cm), 5 n (15 cm)	NR	NR	NR	NR	NR	NR	NR	NR	NR	8	15	12	NR	NR	NR	1	–	NR	NR	–
Govender, 2015	Single-center, retrospective, 2007–2011, South Africa.	Side-by-side	12 mm (Savory)	453	480	410/453	NR	Ultraflex	NR	60 (38–101)	268	185	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	15	26	0	1 Blocked stent, 1 Stricture	NR	2 Iatrogenic TOF, 3 false tracts, 1 perforation	–
Jain, 2016	Single-center, retrospective, Apr 2012 to Mar 2016, India.	Side-by-side	9 mm (Savory)	110	110	110/110	NR	Ultraflex	20n (10 cm), 60n (12 cm), 30n (15 cm)	57.38 ± 21.21 (31–84)	62	48	NR	NR	NR	NR	NR	7.5 ± 3 (3–12)	33	55	22	NR	0	NR	0	–	NR	22 RS pain, 6 hematemesis	–
Kini, 2018	Single-center, retrospective, January 2012 and September 2016, India	Guidewire	No	16	16	16/16	NR	Niti-S, Ultraflex, Endotechnik	NR	56.6 ±13.3	13	3						7.5±2.1	3	11	2	NR	NR	4	1	–	2 min 53sec	4 chest pain, 3 nausea/vomiting, 3 GERD	–
Lazaraki, 2011	Single-center, prospective, Jan 2003 to Jun 2008, Greece.	Side-by-side	10 mm (Savory)	89	83	83/89	82/83	Ultraflex	15 (10 cm), 22 (12 cm), 52 (15 cm)	69.54 ± 7.1	73	16	NR	NR	NR	NR	NR	6.2 ± 2.8	11	24	54	202 (64–382)	6	32	0	–	NR	37 Retrosternal pain, 21 GERD, 1 fever	–
Saligram, 2017	Single-center, retrospective, Jan 2010 to Jun 2015, USA.	Side-by-side	9–12 mm (Savory)	172	280	164/172	NR	Alimaxx-ES	9 cm (4–12)	66 +/- 9	40	132	NR	NR	NR	NR	NR	5.2 +/- 3.6	NR	NR	NR	NR	10	NR	0	–	NR	12 Stent misplacement	–
Sharma, 2012	Single-center, March 2010 to January 2012, India	Side-by-side	8 mm (American)	13	13	12/13	13/13	Ultraflex	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0	–	NR	7 chest pain, 2 reflux	–

▶ **Supplementary Table S1** (Continuation)

Author	Study design	Insertion technique	Pre-Insertion Dilation	# Patients	# Stents	Technical success	Clinical success	Stent type	Stent length (cm)	Age (years)	M	F	Dysphagia duration	Dysphagia deverity				Obst length	Tumor location			Median survival (days)	Stent A/E				Proc Time	AE	
														None	Mild	Mod	Severe		U 1/3	M 1/3	L 1/3		Migration	Overgrowth	Perforation	Others		Early (<30 days)	Late (>30 days)
Siddiqui, 2010	Single-center, prospective, Apr 2006 to Mar 2009, Pakistan.	Side-by-side	11 mm (Savory)	80	75	75/80	NR	Covered nitinol stent with distal release	NR	52.33 + 14.53	35	45	3.86 + 3.25	NR	NR	NR	NR	NR	NR	NR	NR	NR	0	NR	0	–	NR	30 RS pain, 4 UGIB, 4 asp	–
Tahiri. 2015	Single-center, retrospective, May 2009 to May 2011, Canada.	Side-by-side	N	47	47	47/47	NR	Wallflex and Evolution	10 to 15 cm	70.4 ± 9.6	38	9	NR	NR	NR	NR	NR	8.1 ± 3.0	5	22	20	146 ± 26.5	0	4	0	–	NR	4 tumor overgrowth	–
Vermuelen, 2019	Multicenter, prospective, Apr 2017 to Aug 2018, Netherlands.	TTS	NR	32	33	10/33	24/28	Nitinol fcSEMS (BCM Co)	12 n (10 cm), 9 n (12 cm), 12 n (15 cm)	68 ± 11	20	12	NR	–	6	18	8	6.5 ± 3.2	7	7	18	42 (28–91)	5	4	0	–	15 ± 4	29 serious/32 AE; 21 Retrosternal pain, 9 Mild nausea/vomiting, 1 GERD, 1 Anemia, 2 Hemorrhage, 2 (Aspiration) pneumonia, 1 Tracheal compression	–
White, 2001	Single-center, prospective, Aug 1999 to Aug 2000, Kenya	Side-by-side	Y	70	70	70/70	32/70 (1 m follow up)	Wall stent (n = 30) Ultraflex (n = 40) distal or prox release	5 to 15 cm	63 (39 to 85)	43	27	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0	1	2	–	NR	2 perforations, 2 tumor ingrowth, 1 tumor overgrowth	–
Wilkes, 2007	Single-center, retrospective, 5 yrs, United Kingdom.	Side-by-side	TTS (12–13.5 mm)	98	118	90/98	57/98	Ultraflex (prox release)	10 n (7 cm), 20 n (10 cm), 2 n (12 cm), 5 n (15 cm)	75 (42–92)	62	36	NR	1 (grade 1)	11 (grade 2)	57 (grade 3)	29 (grade 4)	NR	8	23	43	100 ± 18.4 (4–921)	3	25	0	–	NR	10 Death, 4 Pain, 2 Vomiting, 5 Recurrence of dysphagia	25 tumor overgrowth, 6 hemorrhage, 5 tracheoesophageal fistula, 13 Food bolus occlusion