

**Original Research Article** 

# Indications for Cold Polypectomy Stratified by the Colorectal Polyp Size: A Systematic Review and Meta-Analysis

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# Abstract

**Objectives:** Cold polypectomy (CP) is widely used because of its safety profile. This systematic review and meta-analysis aimed to clarify the indications for CP based on polyp size.

**Methods:** We searched PubMed and the Cochrane Library for randomized controlled trials that compared cold snare polypectomy (CSP) and other procedures for polyps  $\leq 10$  mm. Large-scale prospective observational studies were also searched to assess delayed bleeding rates. The studies were integrated to assess the risk ratio for incomplete resection rates according to polyp size. The Cochrane risk of bias tool was used to evaluate the study bias. The certainty of cumulative evidence was assessed using the Grading of Recommendations Assessment, Development, and Evaluation system.

**Results:** We found 280 articles and reviewed their eligibility. We selected and extracted 12 randomized controlled trials and 3 prospective observational studies. The risk ratio of incomplete resection of polyps  $\leq$  10 mm using CSP compared with hot snare polypectomy (HSP) was 1.36 (95% confidence interval [CI], 0.92-2.01). The risk ratio for incomplete removal using CSP compared with cold forceps polypectomy (CFP) was 0.50 (95% CI, 0.31-0.82). For polyps  $\leq$ 3 mm, the risk ratio of CSP compared with CFP was 1.40 (95% CI, 0.39-4.95). Certainty of cumulative evidence was considered low. No delayed bleeding after CP was reported after the treatment of 3446 polyps.

**Conclusions:** CSP and HSP may result in the same complete resection rates for polyps  $\leq 10$  mm. For polyps  $\leq 3$  mm, CFP and CSP may have the same resection rates (PROSPERO registration number: CRD 42019122132).

# Keywords

cold snare polypectomy, cold forceps polypectomy, colorectal cancer, colon polyp, colonoscopy, endo-scopy

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# Introduction

Endoscopic removal of colorectal polyps is widely used to prevent future colorectal cancer. Based on the results of the National Polyp Study, removal of colorectal polyps can reduce deaths caused by colorectal cancer[1]. In addition, large-scale case-control studies and cohort studies have reported that colonoscopic interventions reduce the incidence and mortality rates of colorectal cancer[2,3].

Cold polypectomy (CP) is a polypectomy technique used

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to remove small polyps by mechanical transection with a polypectomy snare or forceps without high-frequency current[4]. CP has been used in daily clinical practice since the 1990s[5,6], and its safety and usefulness have been gaining attention since approximately 2010[4]. In recent years, CP has been widely used because of its safety profile. CP comprises cold snare polypectomy (CSP), which uses a polypectomy snare, and cold forceps polypectomy (CFP), which uses forceps.

Recently, trials comparing the effects and risks of CSP and hot snare polypectomy (HSP) or endoscopic mucosal resection (EMR) for colorectal polyps  $\leq 10$  mm have been reported, and systematic reviews with meta-analyses that integrated those trials have been published[7-9]. However, the polyp size was not evaluated in these studies, and no meta-analysis analyzed the influence of the polyp size. Several trials and meta-analyses comparing CSP and CFP have also been reported[11,12]; however, these did not evaluate the polyp size.

In clinical practice, we frequently encounter the question of which procedure to select based on the size of the polyp. It would be clinically useful if the indications for the procedures are clarified according to the polyp size. Therefore, we planned a systematic review and meta-analysis to evaluate incomplete resection rates and to clarify the indications for CP based on the polyp size that was not evaluated in the previous meta-analyses.

# Methods

#### Registration

We created a research plan and registered it with PROS-PERO[12], a systematic review registration system, prior to starting this research (registration number: CRD 42019122132).

#### Eligibility criteria

We included full randomized controlled trials comparing CSP and other endoscopic procedures for polyps  $\leq 10$  mm to assess their beneficial effects and to examine their incomplete resection rates. Furthermore, we included large-scale ( $\geq$  1,000 polyps) prospective cohort studies to assess delayed bleeding rates. We excluded abstracts and proceedings of medical meetings as it is challenging to obtain sufficient information.

#### Search strategy

We searched PubMed and the Cochrane Library. We used the following keywords in PubMed: ("polypectomy"[All Fields] or "emr"[All Fields] or (("endoscopy"[All Fields] or "endoscopic"[All Fields]) and resection[All Fields])) and "cold"[All Fields]. In the Cochrane Library, we used the following keywords: ("cold" and "polypectomy") or ("cold" and "resection"). We requested additional information from the corresponding authors of each article via e-mail, as necessary. The language used in the studies was restricted to English. The date of the last search was January 31, 2019.

# Study selection

First, two reviewers (T.K. and Y.T.) who are endoscopists certified by the Japan Gastroenterological Endoscopy Society shared the literature list and independently evaluated the titles and abstracts. Second, the full texts of the selected literature were independently reviewed for eligibility by the same two reviewers. In the case of disagreement, the two reviewers discussed the issue and decided the eligibility.

## Data extraction

We extracted the following data from each literature: study design, countries, study setting, target polyp size, interventions, endpoints, evaluation method of incomplete resection, and type of snare and forceps.

# **Outcomes and prioritization**

The primary endpoint of this study was the incomplete resection rate according to polyp size. Incomplete resection was defined as positive pathological results at the resection site after polypectomy[13] or polyps for which R0 resection could not be performed[14]. Secondary endpoints were the polyp retrieval rate and delayed bleeding rate. The polyp retrieval rate was defined as the ratio of the specimen obtained for pathological evaluation[15]. Delayed bleeding was defined as bleeding requiring medical treatment or emergency endoscopy after examinations[4,16,17].

#### Risk of bias in individual studies

We estimated the risk of bias of the included studies based on the Cochrane risk of bias criteria, which comprised of selection bias, performance bias, detection bias, attrition bias, reporting bias, and others. The domain of each bias was evaluated as low risk, unclear risk, or high risk. We also used the Cochrane risk bias tool[18].

#### Data synthesis

If studies were sufficiently homogenous in terms of design and comparator, we conducted a meta-analysis. The risk ratios (RR), risk differences (RD), and 95% confidence intervals (CI) of outcomes (incomplete resection, tissue retrieval, and occurrence of delayed bleeding) were calculated using the Mantel-Haenszel method. Statistical heterogeneity was evaluated using the I<sup>2</sup> statistic. Review Manager version 5.3 (The Nordic Cochrane Centre, Copenhagen, Denmark) was used to combine each outcome and assess the bias risk. The statistical review of this study was performed by a biomedical statistician (I.Y.).

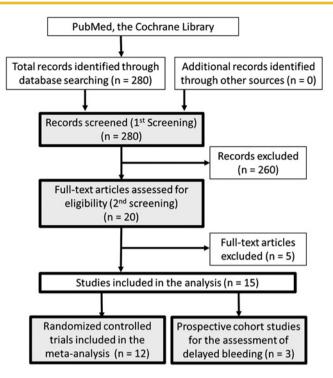


Figure 1. Study flow.

#### **Publication biases**

We checked the registration websites, such as ClinicalTrials.gov (https://clinicaltrials.gov/) and the University Hospital Medical Information Network (https://www.umin.ac.jp/) to evaluate whether selective reporting of outcomes occurred.

#### Certainty in cumulative evidence

To judge the quality of evidence, we referenced the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) methodology[19], using GRADEpro Guideline Development Tool (McMaster University, 2015, developed by Evidence Prime, Inc. Available from https:// gradepro.org/). The quality of evidence was assessed by the domains of the risk of bias, inconsistency, indirectness, imprecision, and other considerations. The limitation of each quality domain was rated as not serious, serious, or very serious. Overall certainty of evidence was evaluated as high (further research is very unlikely to change our confidence in the estimate of the effect), moderate (further research is likely to have an important impact on our confidence in the estimate of the effect and may change the estimate), low (further research is very likely to have an important impact on our confidence in the estimate of the effect and is likely to change the estimate), or very low (any estimate of the effect is very uncertain).

# Results

#### Study selection

Our database search yielded 280 documents for extraction. As a result of the first screening of titles and abstracts, 260 documents were excluded (Figure 1). As a result of checking the full text during the second screening, 5 articles were excluded. The reasons for exclusion were as follows: retrospective analysis[20,21] (n = 2); comparison with hot forceps biopsy[22] (n = 1); comparison with a suction pseudopolyp technique[23] (n = 1); and nonrandomized controlled trial[24] (n = 1). Finally, 12 randomized controlled trials[13-15,25-33] and 3 prospective observational studies[4,16,17] were extracted. We did not conduct funnel plot analyses for publication bias because there were fewer than 10 trials[34].

#### Characteristics of the studies

The countries in which clinical research was performed were Japan (n = 5), Korea (n = 4), Greece (n = 2), China (n = 2)= 1), Germany (n = 1), Italy (n = 1), and the United States (n = 1) (Table 1). The study comparing CSP and HSP targeted polyps ≤10 mm, whereas the study comparing CSP and CFP mainly focused on smaller polyps. In all the studies, except for that by Schett et al.[17], polyp size was estimated comparing the snare, forceps, or endoscopic measurement device. In 8 randomized controlled trials with complete or incomplete resection rates as the primary endpoint[13,25,26,29-33], the completeness of resection was evaluated by biopsy (n = 6), EMR (n = 1), or cold snaring (n = 1) at the resection site. If a biopsy, EMR, or cold snaring from the post-polypectomy ulcer showed residual tumor cells, it was defined as incomplete resection. Of the 6 studies that assessed the complete resection by biopsy, 2 studies evaluated biopsies only from the lateral margin of the postpolypectomy ulcer, and 4 studies evaluated biopsies from both the base and lateral margin of the ulcer. Of the 4 randomized controlled trials in which the primary endpoint was incomplete neither the complete or resection rate[14,15,27,28], 3 reported complete resection and evaluation of the margin of the resected specimen; however, an evaluation of the complete resection was not performed in 1 randomized controlled trial[27]. Of the 12 randomized controlled trials, only 1 used a submucosal injection when CSP was performed[25]. Of the 7 studies evaluating HSP, 3 studies did not use submucosal injections[14,15,28], 2 studies used submucosal injections (expressed as EMR)[25,26], and in the other 2 studies, whether to perform submucosal injection depended on the endoscopist's decision[13,27]. Only 1 of the 12 studies used a dedicated snare for CSP[25], and jumbo forceps were used in only 1 study[29] evaluating CFP (Table 2).

# Table 1. Study Characteristics.

First Author	Year	Study Design	Country	Study Setting	Polyp Size	Procedure	Primary Endpoint	Confirma- tion of Complete Resection
CSP vs HSP (EMR	.)							
Suzuki [14]	2018	RCT, single center	Japan	General hospital	≤10 mm	CSP vs HSP	Resection width achieved by polypectomy	Negative margin of resected specimen
Kawamura [13]	2018	RCT, multicenter	Japan	Multicenter	4-9 mm	CSP vs HSP (EMR)	Complete resection rate	2 biopsies
Papastergiou [25]	2018	RCT, dual center	Greece	Two tertiary referral centers	6-10 mm	CS-EMR vs HS-EMR	Complete resection rate	5 biopsies
Zhang [26]	2018	RCT, single center	China	A tertiary care referral center	6-9 mm	CSP vs EMR	Incomplete resection rate	5 biopsies
Horiuchi [15]	2014	RCT, single center	Japan	General hospital	≤10 mm	CSP vs HSP	Delayed bleeding	Negative margin of the resected specimen
Paspatis [27]	2011	RCT, single center	Greece	General hospital	3-8 mm	CSP vs HSP (EMR)	Delayed bleeding	/
Ichise [28]	2011	RCT, single center	Japan	General hospital	≤8 mm	CSP vs HSP	Abdominal symptoms after polyp- ectomy	Negative margin of the resected specimen
CSP vs CFP (JFP)								
Huh [29]	2019	RCT, dual center	Korea	Two tertiary referral centers	≤5 mm	CSP vs JFP	Complete resection rate	2 biopsies
Park [30]	2016	RCT, single center	Korea	Tertiary care referral hospital	≤5 mm	CSP vs CFP	Complete resection rate	2 biopsies
Kim [31]	2015	RCT, single center	Korea	University hospital	≤7 mm	CSP vs CFP	Complete resection rate	EMR
Lee [32]	2013	RCT, single center	Korea	Academic hospital	≤5 mm	CSP vs CFP	Complete resection rate	2 biopsies
CSP vs HSP vs CF	Р							
Gomez [33]	2015	RCT, single center	United States	An academic hospital	<6 mm	CSP vs HSP vs CFP	Complete resection rate	Cold snaring or 4 biopsies
Prospective cohort	study of	cold polypectomy	7					
Shimodate [16]	2017	Prospective cohort, single center	Japan	General hospital	<10 mm	CSP and CFP	Complica- tion	/
Schett [17]	2017	Prospective cohort, single center	Germany	General hospital	4 to ≤15 mm	CSP only	Complica- tion	/
Repici [4]	2012	Prospective cohort, multicenter	Italy	Five endo- scopic centers	<10 mm	CSP and CFP	Complica- tion	/

CSP, cold snare polypectomy; HSP, hot snare polypectomy; EMR, endoscopic mucosal resection; CFP, cold forceps polypectomy; JFP, jumbo forceps polypectomy; RCT, randomized controlled trial; CS-EMR, cold snare endoscopic mucosal resection; HS-EMR, hot snare endoscopic mucosal resection

First Author	Snare for CSP	Snare for HSP (EMR)	Forceps for CFP
Suzuki [14]	Captivator II 10-mm (Boston Scientific)	Captivator II 10-mm (Boston Scientific)	-
Kawamura [13]	Captivator II 10-mm (Boston Scientific)	Captivator II 10-mm (Boston Scientific)	-
Papastergiou [25]	Exacto 9-mm* (US Endoscopy)	Snare Master (Olympus), Acusnare (Cook Medical), Captivator II (Boston Scientific)	-
Zhang [26]	Snare Master 10-mm (Olympus)	Snare Master 10-mm (Olympus)	-
Horiuchi [15]	Dual-loop wire snare 33/16 mm (Medico's Hirata)	Dual-loop wire snare 33/16 mm (Medico's Hirata)	-
Paspatis [27]	Snare 13-mm (Boston Sensation Polypectomy Scientific)	Sensation Polypectomy Snare 13-mm (Boston Scientific)	-
Ichise [28]	SD-7P-1, BP-1 (Olympus)	Unknown	-
Huh [29]	SGO-1622S 10-mm (Endo-Therapeutics)	-	Radial Jaw 4 jumbo forceps* (Boston Scientific)
Park [30]	A micro-oval snare 10-mm (SD-210U-10; Olympus)	-	Oval spoon-shaped mouth forceps (MTW)
Kim [31]	A micro-oval snare 10-mm (SD-210U-10; Olympus)	-	Standard capacity forceps (FB-24U-1; Olympus)
Lee [32]	A micro-oval snare 10-mm (SD-210U-10; Olympus)	-	Standard capacity forceps (FB-24U-1; Olympus)
Gomez [33]	Captiflex Extra Small Oval 11-mm (Boston Scientific)	Captiflex Extra Small Oval 11-mm (Boston Scientific)	Radial Jaw 4 Large Capacity with a 2.8-mm needle (Boston Scientific)

Table 2. Snare and Forceps Used in Randomized Controlled Trials.

\* Dedicated snare and jumbo forceps are described in bold.

CSP, cold snare polypectomy; HSP, hot snare polypectomy; EMR, endoscopic mucosal resection; CFP, cold forceps polypectomy

#### Incomplete resection rate

# CSP vs. HSP for polyps $\leq 10 \text{ mm}$

Among the 8 randomized controlled trials comparing CSP and HSP, the complete and incomplete resection rates were randomized evaluated in controlled tri-7 als[13-15,25,26,28,33]. A "complete retrieval rate" was reported in the studies by Ichise et al.[28] and Horiuchi et al.[15], which, according to the corresponding author, meant that the negative rate of the histological margin was not indicated in those studies; furthermore, the corresponding author provided us with unpublished data of the negative histological margin rate. In each group, 849 polyps were evaluated for incomplete resection. The RR and RD of incomplete resection for CSP compared with HSP were 1.36 (95% CI, 0.92-2.01) and 0.02 (-0.00-0.04), respectively, which was not significantly different (Figure 2a). Heterogeneity between CSP and HSP studies was moderate ( $I^2$  = 50% in RR analysis).

# CSP vs. HSP for 6-10 mm and 4-5 mm polyps

The incomplete resection rate of 6-10 mm polyps was evaluated by 3 randomized controlled trials. There were 431 polyps in the CSP group and 426 polyps in the HSP group. According to the meta-analysis, there was no significant difference in the incomplete resection rate between the two groups (RR, 1.53; 95% CI, 0.80-2.94; RD, 0.02; 95% CI, -0.01-0.04); however, heterogeneity was large among the studies ( $I^2 = 72\%$  in RR analysis, Figure 2b). Only 2 ran-

domized controlled trials evaluated the incomplete resection rate of 4-5 mm polyps. No significant difference was observed (RR, 1.75; 95% CI, 0.69-4.46; RD, 0.02; 95% CI, -0.01-0.05), and the heterogeneity was also large (I<sup>2</sup> = 63% in RR analysis, Figure 2c).

#### CSP vs. CFP for small polyps

The meta-analysis including all randomized controlled trials comparing CSP and CFP indicated that the incomplete resection rate was significantly higher for CFP than for CSP. The RR and RD for incomplete removal using CSP compared with CFP were 0.50 (95% CI, 0.31-0.82), and -0.07 (95% CI, -0.11 to -0.02), respectively, with relatively small heterogeneity among studies ( $I^2 = 27\%$  in RR analysis, Figure 3a). However, in the case of polyps  $\leq 3$  mm ( $\leq 4$  mm in the study by Kim et al.[31]), there was little difference in the incomplete resection rate between groups, with no heterogeneity among studies ( $I^2 = 0\%$ , Figure 3b).

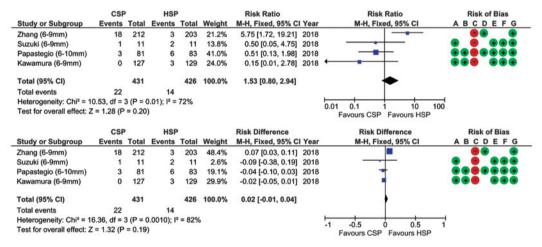
#### Polyp retrieval rate

There was no significant difference in the polyp retrieval rates of CSP and HSP, and there was no heterogeneity ( $I^2 = 0\%$ , Figure 4a). However, the retrieval rate for CFP was significantly higher than that for CSP, and no heterogeneity was observed among the studies ( $I^2 = 0\%$ ). The RD for successful polyp retrieval using CFP compared with CSP was 0.05 (95% CI, 0.02-0.07, Figure 4b).

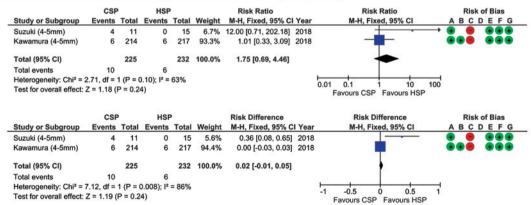
# a. CSP vs HSP for incomplete resection (overall)

	CSF	•	HSP	•		Risk Ratio		Risk Ratio	Risk of Bias
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Fixed, 95% CI	Year	M-H, Fixed, 95% CI	ABCDEFG
Ichise (≤8mm)	10	97	15	100	36.4%	0.69 [0.32, 1.45] 2	2011		
Horiuchi (≤10mm)	8	73	8	75	19.4%	1.03 [0.41, 2.59] 2	2014	-+-	• • ••
Gomez (<6mm)	2	21	1	18	2.7%	1.71 [0.17, 17.38] 2	2015		
Suzuki (≤10mm)	5	22	2	26	4.5%	2.95 [0.63, 13.76] 2	2018		
Papastergiou (6-10mm)	6	83	3	81	7.5%	1.95 [0.51, 7.54] 2	2018		
Kawamura (4-9mm)	6	341	9	346	22.0%	0.68 [0.24, 1.88] 2	2018		$\bullet \bullet \bullet \bullet \bullet \bullet \bullet$
Zhang (6-9mm)	18	212	3	203	7.5%	5.75 [1.72, 19.21] 2	2018		•• •
Total (95% CI)		849		849	100.0%	1.36 [0.92, 2.01]		•	
Total events	55		41						
Heterogeneity: Chi <sup>2</sup> = 12.0	08, df = 6 i	(P = 0.0)	06); l <sup>2</sup> = 50	0%					
T		0 101						0.01 0.1 1 10 100	
l est for overall effect: Z =	1.53 (P =	0.13)						Equative CSD Equative HSD	
l est for overall effect: Z =	1.53 (P =	0.13)						Favours CSP Favours HSP	
Test for overall effect: Z =	1.53 (P =		HSP			Risk Difference		Favours CSP Favours HSP Risk Difference	Risk of Bias
Test for overall effect: Z = Study or Subgroup	CSP		HSP Events		Weight	Risk Difference M-H, Fixed, 95% CI 1	Year		Risk of Bias A B C D E F G
Study or Subgroup	CSP				Weight 11.6%			Risk Difference	
Study or Subgroup chise (≤8mm)	CSP Events	Total	Events	Total		M-H, Fixed, 95% CI	2011	Risk Difference	
<mark>Study or Subgroup</mark> Ichise (≤8mm) Horiuchi (≤10mm)	CSP Events 10	Total 97	Events 15	Total 100	11.6%	M-H, Fixed, 95% CI Y -0.05 [-0.14, 0.05] 2	2011 2014	Risk Difference	
<mark>Study or Subgroup</mark> Ichise (≤8mm) Horiuchi (≤10mm) Gomez (<6mm)	CSP Events 10 8	Total 97 73	Events 15 8	Total 100 75	11.6% 8.7%	M-H, Fixed, 95% CI 1 -0.05 [-0.14, 0.05] 2 0.00 [-0.10, 0.10] 2	2011 2014 2015	Risk Difference	
Study or Subgroup Ichise (≤8mm) Horiuchi (≤10mm) Gomez (<6mm) Suzuki (≤10mm)	CSP Events 10 8 2	Total 97 73 21	Events 15 8 1	Total 100 75 18	11.6% 8.7% 2.3%	M-H, Fixed, 95% CI 1 -0.05 [-0.14, 0.05] 2 0.00 [-0.10, 0.10] 2 0.04 [-0.12, 0.20] 2	2011 2014 2015 2018	Risk Difference	
	CSP Events 10 8 2 5	Total 97 73 21 22	Events 15 8 1 2	Total 100 75 18 26	11.6% 8.7% 2.3% 2.8%	M-H, Fixed, 95% CI 1 -0.05 [-0.14, 0.05] 2 0.00 [-0.10, 0.10] 2 0.04 [-0.12, 0.20] 2 0.15 [-0.05, 0.35] 2	2011 2014 2015 2018 2018	Risk Difference	
Study or Subgroup Ichise (≲8mm) Horiuchi (≤10mm) Gomez (<6mm) Suzuki (≤10mm) Papastergiou (6-10mm)	CSP Events 10 8 2 5 6	Total 97 73 21 22 83	Events 15 8 1 2 3	Total 100 75 18 26 81	11.6% 8.7% 2.3% 2.8% 9.7%	M-H, Fixed, 95% CI \ -0.05 [-0.14, 0.05] 2 0.00 [-0.10, 0.10] 2 0.04 [-0.12, 0.20] 2 0.15 [-0.05, 0.35] 2 0.04 [-0.03, 0.10] 2	2011 2014 2015 2018 2018 2018 2018	Risk Difference	
Study or Subgroup chise (≤8mm) łoriuchi (≤10mm) Somez (<6mm) Suzuki (≤10mm) Papastergiou (6-10mm) Gawamura (4-9mm)	CSP Events 10 8 2 5 6 6	Total 97 73 21 22 83 341	Events 15 8 1 2 3 9	Total 100 75 18 26 81 346	11.6% 8.7% 2.3% 2.8% 9.7% 40.5%	M-H, Fixed, 95% CI 1 -0.05 [-0.14, 0.05] 2 0.00 [-0.10, 0.10] 2 0.04 [-0.12, 0.20] 2 0.15 [-0.05, 0.35] 2 0.04 [-0.03, 0.10] 2 -0.01 [-0.03, 0.01] 2	2011 2014 2015 2018 2018 2018 2018	Risk Difference	
Study or Subgroup chise (:Smm) Horiuchi (:10mm) Sourez (:6mm) Suzuki (:10mm) Suzuki (:10mm) Apastergiou (6-10mm) (awamura (4-9mm) Zhang (6-9mm)	CSP Events 10 8 2 5 6 6	Total 97 73 21 22 83 341 212	Events 15 8 1 2 3 9	Total 100 75 18 26 81 346 203	11.6% 8.7% 2.3% 2.8% 9.7% 40.5% 24.4%	M-H, Fixed, 95% CI 1 -0.05 [-0.14, 0.05] 2 0.00 [-0.10, 0.10] 2 0.04 [-0.12, 0.20] 2 0.15 [-0.05, 0.35] 2 0.04 [-0.03, 0.10] 2 -0.01 [-0.03, 0.01] 2 0.07 [0.03, 0.11] 2	2011 2014 2015 2018 2018 2018 2018	Risk Difference	
Study or Subgroup chise (≲8mm) Horiuchi (≤10mm) Souzuki (≤10mm) Suzuki (≤10mm) Apapastergiou (6-10mm) Kawamura (4-9mm) Zhang (6-9mm) Fotal (95% CI)	CSP Events 10 8 2 5 6 6 6 18 55	Total 97 73 21 22 83 341 212 849	Events 15 8 1 2 3 9 3 41	Total 100 75 18 26 81 346 203 849	11.6% 8.7% 2.3% 2.8% 9.7% 40.5% 24.4%	M-H, Fixed, 95% CI 1 -0.05 [-0.14, 0.05] 2 0.00 [-0.10, 0.10] 2 0.04 [-0.12, 0.20] 2 0.15 [-0.05, 0.35] 2 0.04 [-0.03, 0.10] 2 -0.01 [-0.03, 0.01] 2 0.07 [0.03, 0.11] 2	2011 2014 2015 2018 2018 2018 2018	Risk Difference	

# b. CSP vs HSP for incomplete resection (6-10mm)



# c. CSP vs HSP for incomplete resection (4-5mm)



**Figure 2.** Forest plots of cold snare polypectomy (CSP) versus hot snare polypectomy (HSP) to determine incomplete resection rates according to polyp size. Risk of bias legend: A, random sequence generation (selection bias); B, allocation concealment (selection bias); C, blinding of participants and personnel (performance bias); D, blinding of outcome assessment (detection bias); E, incomplete outcome data (attrition bias); F, selective reporting (reporting bias); and G, other bias.

# a. CSP vs CFP for incomplete resection (overall)

	CS	Р	CF	P		Risk Ratio		Risk Ratio	Risk of Bias
Study or Subgroup	Events	Total	Events	s Tota	Weight	M-H, Fixed, 95% C	Year	M-H, Fixed, 95% CI	ABCDEFG
Lee (≤5mm)	4	- 59	14	1 58	31.1%	0.28 [0.10, 0.80]	2013		$\bullet  \bullet \bullet \bullet \bullet \bullet \bullet$
Kim (≤7mm)	2	59	12	2 69	24.4%	0.19 [0.05, 0.84]	2015		
Gomez (<6mm)	2	21	2	2 18	4.7%	0.86 [0.13, 5.48]	2015		$\bullet \bullet \bullet \bullet \bullet \bullet$
Park (≤5mm)	8	115	11	116	24.1%	0.73 [0.31, 1.76]	2016		$\bullet  \bullet \bullet \bullet \bullet \bullet \bullet$
Huh (≤5mm)	7	90	7	87	15.7%	0.97 [0.35, 2.64]	2019	-	$\bullet  \bullet \bullet \bullet \bullet \bullet \bullet$
Total (95% CI)		344		348	100.0%	0.50 [0.31, 0.82]		•	
Total events	23		46	5				an an an an an	
Heterogeneity: Chi <sup>2</sup> =	5.46, df =	4 (P =	0.24); l <sup>2</sup>	= 27%				0.01 0.1 1 10 100	1
Test for overall effect	: Z = 2.78	(P = 0.0)	005)					Favours CSP Favours CFP	
	CSP		CFP			Risk Difference		Risk Difference	Risk of Bias
Study or Subgroup	Events		Events			M-H, Fixed, 95% CI	Year	M-H, Fixed, 95% Cl	ABCDEFG
.ee (≤5mm)	4	59	14	58	16.9%	-0.17 [-0.30, -0.05]			• ••••
Kim (≤7mm)	2	59	12	69	18.4%	-0.14 [-0.24, -0.04]	2015		
Gomez (<6mm)	2	21	2	18	5.6%	-0.02 [-0.21, 0.18]	2015		
Park (≤5mm)	8	115	11	116	33.4%	-0.03 [-0.10, 0.05]	2016	*	• ••••
łuh (≤5mm)	7	90	7	87	25.6%	-0.00 [-0.08, 0.08]	2019	+	• •••••
Total (95% CI)		344		348	100.0%	-0.07 [-0.11, -0.02]		•	
otal (95% CI) otal events	23	344	46	348	100.0%	-0.07 [-0.11, -0.02]		•	
	and the second sec				100.0%	-0.07 [-0.11, -0.02]		► -1 -0.5 0 0.5 1	

Favours CSP Favours CFP

# b. CSP vs CFP for incomplete resection (≤3mm)

	CSP	•	CFF	>		Risk Ratio	Risk Ratio	<b>Risk of Bias</b>
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Fixed, 95% CI Year	M-H, Fixed, 95% CI	ABCDEFG
Kim (≤4mm)	0	27	1	32	34.0%	0.39 [0.02, 9.27] 2015		
Park (≤3mm)	4	54	2	48	52.3%	1.78 [0.34, 9.28] 2016		$\bullet$ $\bullet$ $\bullet$ $\bullet$ $\bullet$ $\bullet$ $\bullet$
Huh (≤3mm)	1	31	0	25	13.6%	2.44 [0.10, 57.37] 2019		$\bullet  \bullet \bullet \bullet \bullet \bullet \bullet$
Total (95% CI)		112		105	100.0%	1.40 [0.39, 4.95]	-	
Total events	5		3					
Heterogeneity: Chi <sup>2</sup> = 0	).82, df = :	2 (P = (	0.66); l <sup>2</sup> =	0%				
Test for overall effect:	Z = 0.52 (I	P = 0.6	1)				0.01 0.1 1 10 100 Favours CSP Favours CFP	
	CSP	•	CFF	•		Risk Difference	Risk Difference	<b>Risk of Bias</b>
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Fixed, 95% CI Year	M-H, Fixed, 95% CI	ABCDEFG
Kim (≤4mm)	0	27	1	32	27.2%	-0.03 [-0.12, 0.06] 2015	+	
Park (≤3mm)	4	54	2	48	47.2%	0.03 [-0.06, 0.12] 2016	+	$\bullet  \bullet \bullet \bullet \bullet \bullet \bullet$
Huh (≤3mm)	1	31	0	25	25.7%	0.03 [-0.06, 0.12] 2019	+	$\bullet  \bullet \bullet \bullet \bullet \bullet \bullet$
Total (95% CI)		112		105	100.0%	0.02 [-0.04, 0.07]	•	
Total events	5		3					
Heterogeneity: Chi <sup>2</sup> = 1	.39, df = :	2 (P = (	0.50); l <sup>2</sup> =	0%				
Test for overall effect:	Z = 0.54 (I	P = 0.5	9)				-1 -0.5 0 0.5 1 Favours CSP Favours CFP	

Figure 3. Forest plots of cold snare polypectomy (CSP) versus cold forceps polypectomy (CFP) for incomplete resection rates according to polyp size. Risk of bias legend: A, random sequence generation (selection bias); B, allocation concealment (selection bias); C, blinding of participants and personnel (performance bias); D, blinding of outcome assessment (detection bias); E, incomplete outcome data (attrition bias); F, selective reporting (reporting bias); and G, other bias.

# Delayed bleeding rate

For both CSP and HSP, the delayed bleeding rates were extremely low (Figure 4c). If the evaluation of delayed bleeding was insufficient when data from only randomized controlled trials were used, then we included prospective observational studies in the analysis. We found 3 observational studies and conducted a meta-analysis. The results indicated that 3446 polyps were removed by CP (2518 by CSP and 928 by CFP) and there was no delayed bleeding. The delayed bleeding rate after CP was expected to be <0.03%.

# a. CSP vs HSP for polyp retrieval

Horiuchi (≤10mm)         0         35         5         35         69.0%         0.09 [0.01, 1.58]         2014         Image: Constraint of the standard of t										
Parpais (Shm) 8 208 8 200 32.5% 0.9 (203, 2.59) 2011 thick (Shm) 5 78 6 81 23.7% 0.8 (204, 21) 2011 thick (Shm) 5 78 6 81 23.7% 0.8 (204, 22) 2011 thick (Shm) 5 78 6 81 23.7% 0.8 (204, 22) 2011 thick (Shm) 6 1 23 0 22 0 2.25 thick (Shm) 7 394 3 402 11.9% 2.28 (0.62, 9.14) 2015 thick (Shm) 7 394 3 402 11.9% 2.28 (0.62, 9.14) 2015 thick (Shm) 7 394 3 402 11.9% 2.28 (0.62, 9.14) 2015 thick (Shm) 8 106 1 10 10 10 10 10 10 10 10 10 10 10 10 1										
$\frac{1}{100} (c) \frac{1}{100} + $									M-H, Fixed, 95% CI	ABCDEFG
$\frac{b_{1}b_{2}}{b_{2}} (c_{1}b_{2}b_{1}) = \frac{b_{1}}{b_{2}} (c_{2}b_{2}^{2} (c_{2}^{2} (c_{2} (c$		~		~					T	
$ \frac{\text{Some 1}}{\text{parsterplice}} 0 & \frac{12}{27} & 0 & \frac{12}{28} & \text{Not estimate 2015} \\ \text{Not estimate 2015} \\ \text{Not estimate 2015} \\ \text{Not estimate 2016} \\ N$										
Dang Gebrand Dang Gebrand D				-						
Size if (S10m) 0 25 0 27 Not estimable 2018 Size if (S10m) 6 83 4 81 13.5% 14.500 2018 Size if (S10m) 7 394 3 402 11.9% 2.28 [0.62, 9.14] 2018 Size if (S10m) 1 173 1177 100.0% 1.21 [0.72, 2.03] Size if (S10m) 1 173 21177 100.0% 1.21 [0.72, 2.03] Size if (S10m) 1 173 21177 100.0% 1.21 [0.72, 2.03] Size if (S10m) 1 173 21177 100.0% 1.21 [0.72, 2.03] Size if (S10m) 1 173 21177 100.0% 1.21 [0.72, 2.03] Size if (S10m) 1 173 21177 100.0% 1.21 [0.72, 2.03] Size if (S10m) 1 173 21177 100.0% 0.001 2015 Size if (S10m) 1 201 8 200 174% 2001 [0.04, 0.04] 2011 Size if (S10m) 1 201 8 200 174% 2001 [0.06, 0.07] 2014 Size if (S10m) 1 275 6 6 11 6.7% 2001 [0.06, 0.07] 2014 Size if (S10m) 1 275 0 250 223 250 001 [0.07, 0.07] 2018 Size if (S10m) 0 225 0 277 2 258 22.3% 0.001 [0.07, 0.07] 2018 Size if (S10m) 0 2 257 0 258 22.3% 0.001 [0.07, 0.07] 2018 Size if (S10m) 0 2 257 0 258 22.3% 0.001 [0.07, 0.07] 2018 Size if (S10m) 0 2 257 0 258 22.3% 0.001 [0.07, 0.07] 2018 Size if (S10m) 0 2 25 0 277 2 258 0.223 (0.07) 2018 Size if (S10m) 0 2 25 0 277 2 258 0.001 [0.07, 0.07] 2018 Size if (S10m) 0 2 25 0 277 2 258 0.001 [0.07, 0.07] 2018 Size if (S10m) 0 2 25 0 277 2 258 0.001 [0.07, 0.07] 2018 Size if (S10m) 0 2 25 0 277 2 258 0.001 [0.07, 0.07] 2018 Size if (S10m) 0 2 25 0 277 2 258 0.001 [0.07, 0.07] 2018 Size if (S10m) 0 2 3 0 251 1 Mile Neight M-H, Fize d, 55%, C1 Year H-H, Fize d, 55%, C1 A B C D E F Q Size if (S10m) 1 98 0 98 225 1 Mile Neight M-H, Fize d, 55%, C1 Year H-H, Fize d, 55%, C1 A B C D E F Q Size if (S10m) 1 98 0 98 221 0.0% 0.05 [0.02, 0.07] Fize if (S10m) 1 98 0 98 221 0.0% 0.05 [0.02, 0.07] Fize if (S10m) 1 98 0 98 221 0.0% 0.05 [0.02, 0.07] Fize if (S10m) 1 98 0 98 221 0.0% 0.05 [0.02, 0.07] Fize if (S10m) 1 98 0 98 221 0.0% 0.05 [0.02, 0.07] Fize if (S10m) 1 98 0 98 221 0.0% 0.05 [0.02, 0.07] Fize if (S10m) 1 98 0 98 221 0.0% 0.05 [0.02, 0.07] Fize if (S10m) 1 98 0 98 221 0.0% 0.05 [0.02, 0.07] Fize if (S10m) 1 98 0 98 231 0.0% 0.05 [0.02, 0.07] Fize if (S10m) 1 98 0 98 231 0				-						
Papastergiou (G-10mm) 6 83 4 81 13.3% 1.46 [0.43, 5.00] 2018 Gamma (G-40mm) 7 3 94 3 402 11.9% 2.28 [0.52, 9.14] 2018 Total (95% C) 11779 1177 100.0% 1.21 [0.72, 2.03] 0.01 0.1 1 0.0 100 Feators and effect 2 = 0.31; F = 0.5% Feators correct and effect 2 = 0.31; F = 0.5% Feators correct and effect 2 = 0.31; F = 0.5% Feators correct and effect 2 = 0.31; F = 0.5% Feators correct and effect 2 = 0.31; F = 0.5% Feators correct and effect 2 = 0.31; F = 0.5% Feators correct and effect 2 = 0.31; F = 0.5% Feators correct and effect 2 = 0.31; F = 0.5% Feators correct and effect 2 = 0.31; F = 0.5% Feators correct and effect 2 = 0.31; F = 0.5% Feators correct and effect 2 = 0.31; F = 0.5% Feators correct and effect 2 = 0.31; F = 0.5% Feators correct and effect 2 = 0.31; F = 0.5% Feators correct and effect 2 = 0.31; F = 0.5% Feators correct and effect 2 = 0.30; F = 0.5% Feators correct and effect 2 = 0.30; F = 0.5% Feators correct and effect 2 = 0.30; F = 0.5% Feators correct and effect 2 = 0.30; F = 0.5% Feators correct and effect 2 = 0.30; F = 0.5% Feators correct and effect 2 = 0.30; F = 0.5% Feators correct and effect 2 = 0.30; F = 0.5% Feators correct and effect 2 = 0.30; F = 0.5% Feators correct and effect 2 = 0.30; F = 0.5% Feators correct and effect 2 = 0.30; F = 0.5% Feators correct and effect 2 = 0.30; F = 0.5% Feators correct and effect 2 = 0.30; F = 0.5% Feators correct and effect 2 = 0.30; F = 0.5% Feators correct and effect 2 = 0.30; F = 0.5% Feators correct and effect 2 = 0.30; F = 0.5% Feators correct and effect 2 = 0.30; F = 0.5% Feators correct and effect 2 = 0.30; F = 0.5% Feators correct and effect 2 = 0.30; F = 0.5% Feators correct and effect 2 = 0.30; F = 0.5% Feators correct and effect 2 = 0.50; F = 0.5% Feators correct and effect 2 = 0.50; F = 0.5% Feators correct and effect 2 = 0.50; F = 0.5% Feators correct and effect 2 = 0.50; F = 0.5% Feators correct and effect 2 = 0.50; F = 0.5% Feators correct and effect 2 = 0.50; F = 0.5% Feators correct and effect				-						
Gammung (4-mm)       7       364       3       402       11 9%       2.38 [0.62, 9.14]       2018         Grade (95% C)       1177       100, 7%       1.21 [0.72, 2.03]       1.21 [0.72, 2.03]       1.21 [0.72, 2.03]         Grade words       CSP       HSP       Kisk Difference       Risk Difference       Risk Difference       Risk Difference       Risk of Bias         Riady ar Studgroup       Events       Total       Events       CSP       Risk of Bias       Risk of Diss       Risk Difference       Risk Risk of Diss       Risk of										
$\frac{1}{104   events} = \frac{1}{30} = \frac{1}{25}$ $\frac{1}{104   events} = \frac{1}{104   events} = \frac{1}{1$			~~							
Total events $30 = 25$ test for overall effect: $Z = 0.72$ (P = 0.81); F = 056; test for overall effect: $Z = 0.72$ (P = 0.47). The product CSP F test HSP Test H		'	001	3				2018		
$\frac{V_{P}}{V_{P}} = 161, d = 4(p = 0.81); p = 0\%;$ $\frac{V_{P}}{P_{AVOUR}} = 160; d = 0.72 (p = 0.47);$ $\frac{V_{P}}{P_{AVOUR}} = \frac{V_{P}}{V_{P}} = \frac{V_{P}}{V_{P}$	otal (95% CI)		1179		1177	100.0%	1.21 [0.72, 2.03]		+	
Test for overall effect: $Z = 0.72 (P = 0.47)$ The product of the set of th										
tindy or Subgroup Events Total Events Total Weight M-H, Fixed, 95% CI Year M-H, Fixed, 95% CI A to D E F G stagals (2-Brm) 4 101 4 104 87% 0.00 [0.05, 0.05] 2011 the (5mm) 4 101 4 104 87% 0.00 [0.05, 0.05] 2011 the (5mm) 0 23 0 18 17% 0.00 [0.00, 0.00] 2015 homa; (6-Brm) 0 25 0 27 2 22% 0.00 [0.01, 0.01] 2018 the (5mm) 0 25 0 27 2 22% 0.00 [0.01, 0.01] 2018 the (5mm) 0 25 0 27 2 22% 0.00 [0.01, 0.01] 2018 the (5mm) 0 25 0 27 2 22% 0.00 [0.01, 0.01] 2018 the (5mm) 0 25 0 27 2 22% 0.00 [0.00, 0.01] 2018 the (5mm) 0 25 0 27 2 22% 0.00 [0.00, 0.01] 2018 the (5mm) 0 25 0 27 2 22% 0.00 [0.00, 0.01] 2018 the (5mm) 0 25 0 27 2 22% 0.00 [0.00, 0.01] 2018 the (5mm) 0 25 0 27 2 22% 0.00 [0.00, 0.01] 2018 the (5mm) 0 25 0 27 2 22% 0.00 [0.00, 0.01] 2018 the (5mm) 0 25 0 27 2 22% 0.00 [0.00, 0.01] 2018 the (5mm) 0 23 0 25 the (5mm) 0 25 0 25 the (5mm) 0 2 30 0 25 the (5mm) 0 1 93 0 98 0 26 25.44% 0.850 [0.04, 100.77] 2018 the (5mm) 0 1 98 0 98 0 25.44% 0.850 [0.04, 100.77] 2018 the (5mm) 0 1 98 0 98 0 25.44% 0.850 [0.04, 100.77] 2016 the (5mm) 0 1 915 0 116 25.14% 19.16 [1.13, 325.45] 2016 the (5mm) 1 98 0 98 0 25.25% 3.00 [0.17, 27.75] 2019 the (5mm) 0 1 15 0 116 25.14% 19.16 [1.13, 325.45] 2016 the (5mm) 1 98 0 98 0 26.25% 0.00 [0.02, 1.07] 2018 the (5mm) 1 98 0 98 26.7% 0.01 [0.00, 0.01] 2013 the (5mm) 1 98 0 98 26.7% 0.01 [0.00, 0.01] 2013 the (5mm) 1 98 0 98 26.7% 0.01 [0.00, 0.01] 2013 the (5mm) 1 98 0 98 26.7% 0.01 [0.00, 0.01] 2013 the (5mm) 1 98 0 98 26.7% 0.01 [0.00, 0.01] 2013 the (5mm) 1 98 0 98 26.7% 0.01 [0.00, 0.01] 2013 the (5mm) 1 98 0 98 26.7% 0.01 [0.00, 0.01] 2013 the (5mm) 1 98 0 98 26.7% 0.01 [0.00, 0.01] 2013 the (5mm) 1 98 0 98 26.7% 0.01 [0.00, 0.01] 2013 the (5mm) 1 98 0 98 26.7% 0.01 [0.00, 0.01] 2013 the (5mm) 1 98 0 98 26.7% 0.01 [0.00, 0.01] 2013 the (5mm) 1 98 0 98 26.7% 0.01 [0.00, 0.01] 2013 the (5mm) 1 98 0 98 26.7% 0.01 [0.00, 0.01] 2013 the (5mm) 1 98 0 98 26.7% 0.01 [0.00, 0.01] 2013 the (5mm) 1 98 0 98 26.7% 0.01 [0.00, 0.01] 2013 the (5mm) 1 98				1); l <sup>2</sup> = 09	6					
$\frac{1}{100} \frac{1}{100} \frac{1}$		CSF	•	HSI	P		<b>Risk Difference</b>		Risk Difference	Risk of Bias
The claim $4$ 101 $4$ 104 $8.7\%$ 0.00 [0.05, 0.05] 2011 binary (Gmm) 0 23 0 16 1.7\% 0.00 [0.09, 0.09] 2015 binary (Gmm) 0 25 0 25 22.5% 0.00 [0.07, 0.07] 2018 binary (Ginm) 0 25 0 27 2.2% 0.00 [0.07, 0.07] 2018 binary (Ginm) 0 25 0 27 2.2% 0.00 [0.07, 0.07] 2018 binary (Ginm) 0 25 0 27 2.2% 0.00 [0.07, 0.07] 2018 binary (Ginm) 0 25 0 27 2.2% 0.00 [0.07, 0.07] 2018 binary (Ginm) 0 25 0 27 2.2% 0.00 [0.07, 0.07] 2018 binary (Ginm) 0 25 0 27 biterogeneity: Ch <sup>2</sup> = 2.39, d = 7 (P = 0.39); P = 0% biterogeneity: Ch <sup>2</sup> = 2.39, d = 7 (P = 0.39); P = 0% biterogeneity: Ch <sup>2</sup> = 2.39, d = 7 (P = 0.39); P = 0% biterogeneity: Ch <sup>2</sup> = 2.30, d = 7 (P = 0.39); P = 0% biterogeneity: Ch <sup>2</sup> = 2.30, d = 7 (P = 0.39); P = 0% biterogeneity: Ch <sup>2</sup> = 2.30, d = 7 (P = 0.39); P = 0% biterogeneity: Ch <sup>2</sup> = 2.30, d = 7 (P = 0.39); P = 0% biterogeneity: Ch <sup>2</sup> = 2.30, d = 7 (P = 0.39); P = 0% biterogeneity: Ch <sup>2</sup> = 2.30, d = 7 (P = 0.39); P = 0% biterogeneity: Ch <sup>2</sup> = 0.70 (P = 0.49); P = 0.5% biterogeneity: Ch <sup>2</sup> = 0.70 (P = 0.49); P = 0.5% biterogeneity: Ch <sup>2</sup> = 0.70 (P = 0.49); P = 0.5% biterogeneity: Ch <sup>2</sup> = 0.77 (f = 0.49); P = 0.5% biterogeneity: Ch <sup>2</sup> = 0.77 (f = 0.49); P = 0.5% biterogeneity: Ch <sup>2</sup> = 0.77 (f = 0.49); P = 0.5% biterogeneity: Ch <sup>2</sup> = 0.77 (f = 0.49); P = 0.5% biterogeneity: Ch <sup>2</sup> = 0.77 (f = 0.49); P = 0.5% biterogeneity: Ch <sup>2</sup> = 0.77 (f = 0.49); P = 0.5% biterogeneity: Ch <sup>2</sup> = 0.77 (f = 0.49); P = 0.5% biterogeneity: Ch <sup>2</sup> = 0.77 (f = 0.49); P = 0.5% biterogeneity: Ch <sup>2</sup> = 0.77 (f = 0.49); P = 0.5% biterogeneity: Ch <sup>2</sup> = 0.75 (f = 0.002) biterogeneity: Ch <sup>2</sup> = 0.75 (f = 0.002) biterogeneity: Ch <sup>2</sup> = 0.75 (f = 0.002) biterogeneity: Ch <sup>2</sup> = 0.002) bit	tudy or Subgroup	Events	Total	Events	Total	Weight	M-H, Fixed, 95% Cl	Year	M-H, Fixed, 95% Cl	ABCDEFG
$\frac{1}{1 + 65} = \frac{1}{2 + 30} + \frac{1}{2 + 3} + \frac{1}{2 + 6} + \frac{1}{2 + 8} + \frac{1}{2 + 2} + \frac{1}{2 + 2} + \frac{1}{2 + 3} $	Paspatis (3-8mm)	8	208	8	206	17.6%	-0.00 [-0.04, 0.04]	2011	+	
$\frac{1}{1 + 0.5} = \frac{1}{0.01} + $		-							+	
bindle (demm) 0 23 0 18 1.7% 0.00 [0.00, 0.01] 2015 bindle (demm) 0 25 0 25 22.5% 0.00 [0.07, 0.07] 2018 bindle (demm) 0 25 0 25 22.5% 0.00 [0.07, 0.07] 2018 bindle (demm) 7 384 3 402 33.8% 0.01 [-0.01, 0.03] 2018 bindle (demm) 7 384 3 402 33.8% 0.01 [-0.01, 0.03] 2018 bindle (demm) 7 384 3 402 33.8% 0.01 [-0.01, 0.03] 2018 bindle (demm) 7 384 3 402 33.8% 0.01 [-0.01, 0.03] 2018 bindle (demm) 7 384 3 402 33.8% 0.01 [-0.01, 0.03] 2018 bindle (demm) 7 384 3 402 33.8% 0.01 [-0.01, 0.03] 2018 bindle (demm) 7 384 3 402 33.8% 0.01 [-0.01, 0.03] 2018 bindle (demm) 7 384 3 402 33.8% 0.01 [-0.01, 0.03] 2018 bindle (demm) 7 384 3 402 33.8% 0.01 [-0.01, 0.03] 2018 bindle (demm) 7 384 3 402 33.8% 0.01 [-0.01, 0.03] 2018 bindle (demm) 7 384 3 402 33.8% 0.01 [-0.01, 0.03] 2018 bindle (demm) 6 23 0 21 bindle (demm) 6 23 0 21 bindle (demm) 6 23 0 21 bindle (demm) 7 3 70 0 75 24.3% 7.49 [0.39, 142.51] 2015 bindle (demm) 1 98 0 98 25.2% 3.00 [0.12, 72.75] 2019 bindle (demm) 1 98 0 98 25.2% 3.00 [0.12, 72.75] 2019 bindle (demm) 1 98 0 98 25.2% 3.00 [0.12, 72.75] 2019 bindle (demm) 1 98 0 98 25.7% 0.07 [-0.00, 0.1] 2015 bindle (demm) 1 98 0 98 25.7% 0.01 [-0.02, 0.037] 2015 bindle (demm) 1 98 0 98 25.7% 0.01 [-0.02, 0.01] 2015 bindle (demm) 1 98 0 98 25.7% 0.01 [-0.02, 0.037] 2015 bindle (demm) 1 98 0 98 25.7% 0.01 [-0.02, 0.01] 2015 bindle (demm) 1 98 0 98 25.7% 0.01 [-0.02, 0.02] bindle (demm) 1 98 0 98 25.7% 0.01 [-0.02, 0.02] bindle (demm) 1 98 0 98 25.7% 0.01 [-0.02, 0.02] bindle (demm) 1 98 0 98 25.7% 0.01 [-0.02, 0.02] 2015 bindle (demm) 1 98 0 98 25.7% 0.01 [-0.02, 0.02] bindle (demm) 1 98 0 98 5 3 68 100.0% 0.05 [0.02, 0.07] bindle (demm) 1 98 0 98 5 5 60 /% 0.00 [-0.03, 0.13] 2016 bindle (demm) 1 98 0 98 5 5 60 /% 0.00 [-0.01, 0.2] 2015 bindle (demm) 1 9 115 0 1116 31.5% 0.06 [0.03, 0.13] 2016 bindle (demm) 0 34 2 40 20 00 bindle (demm) 0 34 2 40 20 20 00 bindle (demm) 0 34 2 40 20 20 00 bin		5		6				2014	+	a á aá
$\frac{1}{2} \frac{1}{2} \frac{1}$									+	
$\frac{1}{2} \frac{1}{2} \frac{1}$									1	
Parasteriptico (6-10mm) 6 83 4 81 7.0% 0.02 [0.05, 0.10] 2018 (awamura (4-9mm) 7 394 3 402 33.8% 0.01 [-0.01, 0.03] 2018 (awamura (4-9mm) 7 394 3 402 33.8% 0.01 [-0.01, 0.03] 2018 Total (95% CI) 1179 1177 100.0% 0.00 [-0.01, 0.02] Total (95% CI) 1179 1177 100.0% 0.00 [-0.01, 0.02] (add (95% CI) 1179 100.0% 0.00 [-0.01, 0.02] (add (95% CI) 1179 1177 100.0% 0.00 [-0.01, 0.02] (add (95% CI) 1179 1177 100.0% 0.00 [-0.01, 0.02] (add (95% CI) 1179 1177 100.0% 0.00 [-0.01, 0.02] (add (95% CI) 10 1179 1177 100.0% 0.00 [-0.01, 0.02] (add (95% CI) 10 1179 1171 101 1172 113 (add (95% CI) 10 117 117 101 1172 113 (add (95% CI) 10 115 0 1116 251% 19.1016 113, 32545 2016 (add (95% CI) 365 368 100.0% 9.63 [2.26, 41.07] Total (95% CI) 365 368 100.0% 9.63 [2.26, 41.07] Total (95% CI) 365 368 100.0% 0.00 [-0.06, 0.06] 2015 (add (95% CI) 365 368 100.0% 0.00 [-0.06, 0.06] 2015 (add (95% CI) 365 368 100.0% 0.00 [-0.06, 0.06] 2015 (add (95% CI) 365 368 100.0% 0.00 [-0.06, 0.06] 2015 (add (95% CI) 365 368 100.0% 0.00 [-0.06, 0.06] 2015 (add (95% CI) 365 368 100.0% 0.00 [-0.06, 0.06] 2015 (add (95% CI) 365 368 100.0% 0.00 [-0.06, 0.06] 2015 (add (95% CI) 365 368 100.0% 0.00 [-0.06, 0.06] 2015 (add (95% CI) 365 368 100.0% 0.05 [0.02, 0.07] (add (9									Ŧ	
$\begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} $				-						
$\frac{\text{Call (15% Cl)}{\text{Cl}} = 0.77, d = 3 (P = 0.93); P = 0\% \\ \frac{\text{Cl}}{\text{Study or Subgroup}} = \frac{\text{CsP}}{\text{Events Total Events Total Weight MH, Fixed, 95% Cl Year MH, Fixed, 95% Cl A B C D E F G \\ \frac{\text{CsP}}{\text{Favours CSP}} = \frac{\text{CsP}}{\text{Study or Subgroup}} = \frac{\text{CsP}}{\text{Events Total Events Total Weight MH, Fixed, 95% Cl Year MH, Fixed, 95% Cl A B C D E F G \\ \frac{\text{CsP}}{\text{Favours CSP}} = \frac{\text{CsP}}{\text{Study or Subgroup}} = \frac{\text{Study or Subgroup}}{\text{Study or Subgroup}} = \frac{\text{Study or Subgroup}}{Study or Subgr$										
$\frac{30}{164 \text{ events}} = \frac{30}{167 \text{ events}} = 30$	andmura (4-9mm)	'	394	3	402	33.0%	0.01[-0.01, 0.03]	2018	Г	
$\frac{30}{164 \text{ events}} = \frac{30}{167 \text{ events}} = 30$	otal (95% CI)		1179		1177	100.0%	0.00 [-0.01, 0.02]			
$\frac{\text{telerosponsity: } Ch^{\mu} = 2.39, df = 7 (P = 0.39); P = 0\%}{\text{test for overall effect; Z = 0.70 (P = 0.48)}}$ $\frac{1 - 0.5 - 0.5 - 1}{\text{Favours CSP}} \frac{1 - 0.5 - 0.5 - 1}{\text{Favours CSP}}$ $\frac{1 - 0.5 - 0.5 - 1}{\text{Favours CSP}} \frac{1 - 0.5 - 0.5 - 1}{\text{Favours CSP}}$ $\frac{1 - 0.5 - 0.5 - 1}{\text{Favours CSP}} \frac{1 - 0.5 - 0.5 - 1}{\text{Favours CSP}}$ $\frac{1 - 0.5 - 0.5 - 1}{\text{Favours CSP}} \frac{1 - 0.5 - 0.5 - 1}{\text{Favours CSP}}$ $\frac{1 - 0.5 - 0.5 - 1}{\text{Favours CSP}} \frac{1 - 0.5 - 0.5 - 1}{\text{Favours CSP}}$ $\frac{1 - 0.5 - 0 - 0.5 - 1}{\text{Favours CSP}} \frac{1 - 0.5 - 0.5 - 1}{\text{Favours CSP}}$ $\frac{1 - 0.5 - 0 - 0.5 - 1}{\text{Favours CSP}} \frac{1 - 0.5 - 0 - 0.5 - 1}{\text{Favours CSP}}$ $\frac{1 - 0.5 - 0 - 0.5 - 1}{\text{Favours CSP}} \frac{1 - 0.5 - 0 - 0.5 - 1}{\text{Favours CSP}}$ $\frac{1 - 0.5 - 0 - 0.5 - 1}{\text{Favours CSP}} \frac{1 - 0.5 - 0 - 0.5 - 1}{\text{Favours CSP}}$ $\frac{1 - 0.5 - 0 - 0.5 - 1}{\text{Favours CSP}} \frac{1 - 0.5 - 0 - 0.5 - 1}{\text{Favours CSP}} \frac{1 - 0.5 - 0 - 0.5 - 1}{\text{Favours CSP}}$ $\frac{1 - 0.5 - 0 - 0.5 - 1}{\text{Favours CSP}} \frac{1 - 0.5 - 0 - 0.5 - 1}{\text$		30		25						
Total (95% CI) Total (95% CI) Total (95% CI) Total (95% CI) Subdy or Subgroup Events Total Events Total Weight MH, Fixed, 95% CI Year MH, Fixed, 95% CI Not estimable 2015 MH, Fixed, 95% CI MH, Fixed, 95% CI MH, Fixed, 95% CI A B C D E F G A B C D	leterogeneity: Chi <sup>2</sup> = 2.39	9, df = 7 (f	P = 0.93	3); I <sup>2</sup> = 09	6					1
<b>b.</b> CSP vs CFP for polyp retrieval Study or Subgroup Events Total Events Total Weight M-H, Fixed, 95% CI vs M-H, Fixed, 95% CI A B C D E F G Study or Subgroup 1 0 23 0 21 1 Not estimable 2015 (m (57mm) 3 70 0 75 24.3% 7.49 [0.38, 142.51] 2015 Total (95% CI) 365 368 100.0% 9.63 [2.28, 41.07] Total (95% CI) 365 368 100.0% 0.07 [-0.00, 0.14] 2013 Somez (Gmm) 0 23 0 21 6.0% 0.07 [-0.00, 0.14] 2013 Somez (Gmm) 0 37 0 0 75 19.8% 0.04 [-0.00, 0.14] 2013 Somez (Gmm) 0 37 0 0 75 19.8% 0.04 [-0.00, 0.14] 2013 Somez (Gmm) 0 37 0 0 75 19.8% 0.04 [-0.00, 0.14] 2013 Somez (Gmm) 0 37 0 0 75 19.8% 0.04 [-0.00, 0.14] 2013 Total events Total Events Total Weight M-H, Fixed, 95% CI Vear M-H, Fixed, 95% CI A B C D E F G Study or Subgroup Events Total Events Total Weight M-H, Fixed, 95% CI Vear M-H, Fixed, 95% CI A B C D E F G Study or Subgroup Events Total Events Total Weight M-H, Fixed, 95% CI Vear M-H, Fixed, 95% CI A B C D E F G Study or Subgroup Events Total Events Total Weight M-H, Fixed, 95% CI Vear M-H, Fixed, 95% CI A B C D E F G Study or Subgroup Events Total Events Total Weight M-H, Fixed, 95% CI Vear M-H, Fixed, 95% CI A B C D E F G Study or Subgroup Events Total Events Total Weight M-H, Fixed, 95% CI Vear M-H, Fixed, 95% CI A B C D E F G Study or Subgroup Events Total Events Total Weight M-H, Fixed, 95% CI Vear M-H, Fixed, 95% CI A B C D E F G Study or Subgroup Events Total Events Total Weight M-H, Fixed, 95% CI Vear M-H, Fixed, 95% CI A B C D E F G Study or Subgroup Events Total Events Total Weight M-H, Fixed, 95% CI Vear M-H, Fixed, 95% CI A B C D E F G Study or Subgroup Events Total Events Total Weight M-H, Fixed, 95% CI Vear M-H, Fixed, 95% CI A B C D E F G Study (Gmm) 0 23 0 18 NOt estimable 2011 Hoticul (S10mm) 0 25 0 27 Not estimable 2015 Stud										
Lee ( $4Smm$ ) 4 59 0 58 25.4% $8.85$ [0.49, 160.77] 2013 Not estimable 2015 Not estimable 2018 Not esti		CSP		CFP			Risk Ratio			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $									M-H, Fixed, 95% CI	ABCDEFG
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $						25.4%				
Park (SSmm) 9 115 0 116 25.1% 19.16 $[1.13, 325.45]$ 2016 Huh (SSmm) 1 98 0 98 25.2% 3.00 $[0.12, 72.75]$ 2019 Total (95% CI) 365 368 100.0% 9.63 $[2.26, 41.07]$ Total (95% CI) 365 368 100.0% 9.63 $[2.26, 41.07]$ Total events 17 0 Heterogeneity: ChP = 0.77, df = 3 (P = 0.86); P = 0% Test for overall effect: Z = 3.06 (P = 0.002) Events Total Events Total Weight M-H, Fixed, 95% CI Year M-H, Fixed, 95% CI A B C D E F G as 0 23 0 21 6.0% 0.07 [-0.00, 0.14] 2013 Somez (45mm) 0 23 0 21 6.0% 0.07 [-0.00, 0.14] 2013 Joint (S7mm) 3 70 0 75 19.8% 0.04 [-0.01, 0.10] 2015 Jark (S5mm) 9 115 0 116 31.5% 0.08 [0.03, 0.13] 2016 Huh (S5mm) 1 98 0 98 26.7% 0.01 [-0.02, 0.04] 2019 Protal (95% CI) 365 368 100.0% 0.05 [0.02, 0.07] Total effect: Z = 3.75 (P = 0.0002) Exerts Total Events Total Events Total Weight M-H, Fixed, 95% CI A B C D E F G Total (95% CI) 365 368 100.0% 0.05 [0.02, 0.07] Total events 17 0 Heterogeneity: ChP = 9.60, df = 4 (P = 0.05); P = 58% Test for overall effect: Z = 3.75 (P = 0.0002) Exerts Total Events Total Events Total Weight M-H, Fixed, 95% CI Year H-H, Fixed, 95% CI A B C D E F G Btudy or Subgroup Events Total Events Total Weight M-H, Fixed, 95% CI Year M-H, Fixed, 95% CI A B C D E F G Btudy or Subgroup Events Total Events Total Weight M-H, Fixed, 95% CI A B C D E F G Btudy or Subgroup Events Total Events Total Weight M-H, Fixed, 95% CI A B C D E F G Btudy or Subgroup Events Total Events Total Weight M-H, Fixed, 95% CI A B C D E F G Btudy or Subgroup Events Total Events Total Weight M-H, Fixed, 95% CI A B C D E F G Btudy or Subgroup Events Total Events Total Weight M-H, Fixed, 95% CI A B C D E F G Btudy or Subgroup Events Total Events Total Weight M-H, Fixed, 95% CI A B C D E F G Btudy or Subgroup Events Total Events Total Weight M-H, Fixed, 95% CI A B C D E F G Btudy (160mm) 0 240 0 240 Not estimable 2011 Heterogeneity: ChP = 9.60, 002 0 118 Btudy (150mm) 0 25 0 27 Not estimable 2018 Btudy (150mm) 0 240 0 83 Not estimable 2018 Btudy (160mm) 0 84 0 83 Not estimable 2										
Huh (\$5mm)       1       98       0       98       25.2%       3.00       [0.12, 72, 75]       2019         Total (95% CI)       365       368       100.0%       9.63       [2.26, 41.07]         Total events       17       0         Heterogeneity: ChP = 0.7, 61 = 0.7, 61 = 0.7, 61 = 0.002)       Events       Total events       10       10       100         Test for overall effect: Z = 3.06 (P = 0.002)       Events       Total Veight       M-H, Fixed, 95% CI Year       M-H, Fixed, 95% CI A B C D E F G         Sudy or Subgroup       Events       Total Events       Total Weight       M-H, Fixed, 95% CI Year       M-H, Fixed, 95% CI A B C D E F G         Somez (45mm)       0       23       0       21       6.0%       0.00 [-0.00, 0.14]       2013         Somez (45mm)       9       116       31.5%       0.08 (0.03, 0.13)       2016       A B C D E F G         strk (55mm)       9       116       31.5%       0.08 (0.03, 0.13)       2016       Favours CSP       Favours CSP         Featorsoneity: ChP = 9.60, df = 4 (P = 0.05); P = 58%       Favours CSP       Favours CFP       Favours CFP       Favours CFP       Favours CFP         Study or Subgroup       Events       Total Events       17       0       0.05 [0.02,										
Total (95% CI)       365       368       100.0%       9.63 [2.26, 41.07]         Total events       17       0         Total events       17       0         Total events       100.0%       9.63 [2.26, 41.07]         Total events       100.0%       0.01			115		116					
Total events       17       0         reterogeneity: Chi <sup>2</sup> = 0.77, df = 3 (P = 0.86); P = 0%       0.01       0.1       1       10       100         Fest for overall effect: Z = 3.06 (P = 0.002)       CSP       CFP       Risk Difference       Risk Di	Huh (≤5mm)	1	98	0	98	25.2%	3.00 [0.12, 72.75]	2019		• • •••
Total events       17       0         reterogeneity: Chi <sup>2</sup> = 0.77, df = 3 (P = 0.86); P = 0%       0.01       0.1       1       10       100         East for overall effect: Z = 3.06 (P = 0.002)       CSP       CFP       Risk Difference       Risk Di	Total (95% CI)		365		368	100.0%	9 63 [2 26, 41,07]			
Heterogeneity: ChP = 0.77, df = 3 (P = 0.86); P = 0% Test for overall effect: Z = 3.06 (P = 0.002) Study or Subgroup Events Total Events Total Weight M-H, Fixed, 95% CI Year M-H, Fixed, 95% CI Ye		17		0			and famel and i			
CSP       CFP       Risk Difference       Risk Difference         Study or Subgroup       CSP       CFP       Risk Difference       Risk Difference       Risk Difference       Risk of Bias         Study or Subgroup       CSP       CFP       Risk Difference       Risk Difference       Risk of Bias         Study or Subgroup       Events Total Events Total Weight       M-H, Fixed, 95% CI Year       M-H, Fixed, 95% CI A B C D E F G         Study or Subgroup       Study or Subgroup       Risk of Bias         Art (S5mm)       9       Risk of Bias         Art (S5mm)       9       Risk of Bias         Total (95% CI)       365       368       100.01 [-0.02, 0.04] 2019         For UP 9 9.60, df = 4 (P = 0.05); P = 58%       Favours CFP       Favours CFP         Events Total Events Total Weight       M-H, Fixed, 95% CI Year       M-H, Fixed, 95% CI A B C D E F G         CSP HSP for delayed bleeding       Not estimable 2011       A B C D E F G			/P - 0 9		196					
Budy or Subgroup         Events         Total         Events         Total         Weight         M-H, Fixed, 95% CI         A B C D E F C           .ee (55mm)         4         59         0         58         16.0%         0.07 (-0.00, 0.14)         2013           Jomez (46mm)         0         23         0         16.0%         0.00 (-0.00, 0.14)         2013           Gm (57mm)         3         70         0         75         19.8%         0.04 (-0.01, 0.10)         2015           Jark (55mm)         9         115         0         116         31.5%         0.08 (0.03, 0.13)         2016           Jult (55mm)         9         115         0         116         31.5%         0.08 (0.02, 0.07)           Total (95% CI)         365         368         100.0%         0.05 [0.02, 0.07]         -1         -0.5         0         0.5         1           Total events         17         0         0         95% CI         A B C D E F G         0         -1         -0.5         0         0.5         1           Feavours CSP         Favours CSP         Favours CSP         Favours CSP         Favours CSP         A B C D E F G           Study or Subgroup         Events         To					//0					
Budy or Subgroup         Events         Total         Events         Total         Weight         M-H, Fixed, 95% Cl Year         M-H, Fixed, 95% Cl A B C D E F G           .ee (55mm)         4         59         0         58         16.0%         0.07 [-0.00, 0.14]         2013           Somez (56mm)         0         23         0         21         6.0%         0.00 [-0.00, 0.14]         2013           Grim (57mm)         3         70         0         75         19.8%         0.04 [-0.01, 0.01]         2015           Park (55mm)         9         115         0         116         31.5%         0.08 [0.03, 0.13]         2016           tult (55mm)         1         98         26.7%         0.01 [-0.02, 0.04]         2019           fotal (95% Cl)         365         368         100.0%         0.05 [0.02, 0.07]           fotal events         17         0         958         10.0%         0.05 [0.02, 0.07]           fotal events         17         0         0         0.5         0.5         1           fotal ovental effect: Z = 3.75 (P = 0.0002)         For         A B C D E F G         A B C D E F G           study or Subgroup         Events         Total         Events         Total <td></td> <td>CSP</td> <td></td> <td>CEP</td> <td></td> <td></td> <td>Risk Difference</td> <td></td> <td>Risk Difference</td> <td>Risk of Bias</td>		CSP		CEP			Risk Difference		Risk Difference	Risk of Bias
see (55mm)       4       59       0       58       16.0%       0.07 [-0.00, 0.14]       2013         3omez (45mm)       0       23       0       21       6.0%       0.00 [-0.08, 0.08]       2015         im (57mm)       3       70       0       75       18.9%       0.04 (-0.01, 0.01)       2015         ark (55mm)       9       116       31.5%       0.08 [0.03, 0.13]       2016         ark (55mm)       9       116       31.5%       0.08 [0.03, 0.13]       2019         rotal (95% CI)       365       368       100.0%       0.05 [0.02, 0.07]         rotal events       17       0         rest for overall effect: Z = 3.75 (P = 0.0002)       0.05 [0.02, 0.07]         Favours CSP Favours CSP Favours CSP         Study or Subgroup       Events       Total       Weight       M-H, Fixed, 95% CI       A B C D E F G         Study or Subgroup       Events       Total       Weight       M-H, Fixed, 95% CI Year       M-H, Fixed, 95% CI       A B C D E F G         stady or Subgroup       Events       Total       Weight       M-H, Fixed, 95% CI Year       M-H, Fixed, 95% CI       A B C D E F G         stady (15 f0mm)       0       0       0	Study or Subgroup	Events 1	Total E		Total	Weight		Year		
Somez (-6mm)         0         23         0         21         6.0%         0.00 [-0.08, 0.08]         2015           Sim (s7mm)         3         70         0         75         19.8%         0.04 [-0.01, 0.10]         2015           sim (s7mm)         3         70         0         75         19.8%         0.04 [-0.01, 0.10]         2015           sim (s7mm)         1         98         0         98         26.7%         0.01 [-0.02, 0.04]         2019           fotal (95% CI)         365         368         100.0%         0.05 [0.02, 0.07]				0				_	-	
Gim (37mm)       3       70       0       75       19.8%       0.04 [-0.01, 0.10]       2015         Park (55mm)       9       115       0       116       31.5%       0.08 [0.03, 0.13]       2016         Uh (55mm)       1       98       0.98       26.7%       0.01 [-0.02, 0.04]       2019         Total (95% CI)       365       368       100.0%       0.05 [0.02, 0.07]       -1       -0.5       0       0.5       1         Total events       17       0       0       9.80       26.7%       0.01 [-0.02, 0.04]       2019       -1       -0.5       0       0.5       1         Total events       17       0       0.05 [0.02, 0.07]       -1       -0.5       0       0.5       1         Fest for overall effect: Z = 3.75 (P = 0.0002)       P = 58%       Pavours CSP       Favours CSP       Favours CSP       Favours CSP         Study or Subgroup       Events       Total       Events       Total       Weight       M-H, Fixed, 95% CI       A B C D E F G         Paspatis (3-8mm)       0       208       0       206       Not estimable       2011									+	
Park (25mm)       9       115       0       116       31.5%       0.08 [0.03, 0.13]       2016         tuh (55mm)       1       98       28.7%       0.01 [-0.02, 0.04]       2019         Total (95% CI)       365       368       100.0%       0.05 [0.02, 0.07]         Total events       17       0       0.05 [0.02, 0.07]         Total events       17       0       0.5       0.05 [0.02, 0.07]         Test for overall effect: Z = 3.75 (P = 0.0002)       Favours CSP       Favours CSP       1         CSP HSP for delayed bleeding         Study or Subgroup       Events Total Events Total Weight       M-H, Fixed, 95% CI Year       A B C D E F G         Pasatis (3-8mm)       0       208       0       206       Not estimable       2011         tofaies (38mm)       0       40       0       40       0.201       0.208       0.206       Not estimable       2011         tofaies (38mm)       0       208       0.206       Not estimable       2011       4 B C D E F G         Study or Subgroup       Events Total Events Total Weight       M-H, Fixed, 95% CI Hag       A B C D E F G         Study (510mm)       0       208       0.206       0.09 [0.01, 1.58] <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>L</td><td></td></t<>									L	
tuh (s5mm)       1       98       0       98       26.7%       0.01 [-0.02, 0.04]       2019         Total (95% CI)       365       368       100.0%       0.05 [0.02, 0.07]       1       1       -0.5       0       0.5       1         Total (95% CI)       365       368       100.0%       0.05 [0.02, 0.07]       1       1       -0.5       0       0.5       1         Total events       17       0       0       0.05 [0.02, 0.07]       1       1       -0.5       0       0.5       1         Fest for overall effect: Z = 3.75 (P = 0.0002)       P = 0.0002)       Events       Total Events       Total Events       Not estimable       0.5       1         Study or Subgroup       Events       Total Events       Total Events       Total Events       Total Events       Not estimable       2011       A B C D E F G         Paspatis (3-8mm)       0       208       0       206       Not estimable       2011       Image: Study or Subgroup       Fisk Ratio       A B C D E F G         Paspatis (3-8mm)       0       40       0       0.20 [0.01, 1.58]       2014       Image: Study or Subgroup       Image: Study or Subgroup       Image: Study or Subgroup       Image: Study or Subgroup       Image: St									<b>—</b>	
Fotal (95% CI)       365       368       100.0%       0.05 [0.02, 0.07]         Total (95% CI)       365       368       100.0%       0.05 [0.02, 0.07]         Teleforgeneity: ChiP = 9.60, df = 4 (P = 0.05); P = 58%       1       -1       -0.5       0         rest for overall effect: Z = 3.75 (P = 0.0002)       -1       -0.5       0       0.5       1         Fest for overall effect: Z = 3.75 (P = 0.0002)       Events       Total Events       Total Events       Total Events       Not estimable       0.5       0.5       1         Study or Subgroup       Events       Total Events       Total Weight       M-H, Fixed, 95% CI Year       M-H, Fixed, 95% CI       A B C D E F O         Paspatis (3-8mm)       0       208       0       206       Not estimable       2011       Image: Study or Subgroup       Image: Study or Subgroup       Risk Ratio       Risk Ratio       Risk of Bias         Study or Subgroup       0       208       0       206       Not estimable       2011       Image: Study or Subgroup       Image: S									1-	
Total events       17       0         Total events       17       0         Teleterogeneity: Chi <sup>P</sup> = 9.60, off = 4 (P = 0.05); P = 58%       -1       -0.5       0.5       1         Fest for overall effect: Z = 3.75 (P = 0.0002)       -1       -0.5       0.5       1         Exercise of a colspan="2">Figure 10.0002         Exercise of a colspan="2">Risk Ratio         Risk Ratio         Risk Ratio         Risk Total Events Total Weight         M-H; Fixed, 95% CI       A B C D E F G         Paspaterize (S-Brm)       0       0       40       Not estimable 2011       0 <td>nun (somm)</td> <td>1</td> <td>98</td> <td>0</td> <td>98</td> <td>20.7%</td> <td>0.01 [-0.02, 0.04]</td> <td>2019</td> <td>Ī</td> <td></td>	nun (somm)	1	98	0	98	20.7%	0.01 [-0.02, 0.04]	2019	Ī	
Construints         Charles of a 4 (P = 0.05); P = 58%           1 -1 -0.5 0 0.5 1           Favours CSP           Favours CSP is a colspan="2">Favours CSP Favours CFP           CSP HSP for delayed bleeding           Risk Ratio         Risk Ratio         Risk of Bias           A B C D E F G           Paspatie (3-6mm)         0 208         0 206         Not estimable 2011           Check (S8mm)         0 328         0 208         Risk Ratio         Risk of Bias           A B C D E F G           Paspatie (3-6mm)         0 208         Not estimable 2011           Check S0 0         0 200         Not estimable 2011           Check S0 0         0 208         Risk Ratio         Risk of Bias           A B C D E F G           Paspatie (3-6mm)         0 208         Not estimable 2011           Check S0 0         0 200 (0.01, 1, 58) 2014         0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Total (95% CI)		365		368	100.0%	0.05 [0.02, 0.07]		+	
Construints         Charles of a 4 (P = 0.05); P = 58%           1 -1 -0.5 0 0.5 1           Favours CSP           Favours CSP is a colspan="2">Favours CSP Favours CFP           CSP HSP for delayed bleeding           Risk Ratio         Risk Ratio         Risk of Bias           A B C D E F G           Paspatie (3-6mm)         0 208         0 206         Not estimable 2011           Check (S8mm)         0 328         0 208         Risk Ratio         Risk of Bias           A B C D E F G           Paspatie (3-6mm)         0 208         Not estimable 2011           Check S0 0         0 200         Not estimable 2011           Check S0 0         0 208         Risk Ratio         Risk of Bias           A B C D E F G           Paspatie (3-6mm)         0 208         Not estimable 2011           Check S0 0         0 200 (0.01, 1, 58) 2014         0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		17		0						
In the second s			(P = 0 (	•	58%					
Parouis CSP Parolis CSP Parolis CSP Parolis CSP Parolis CSP Parolis CSP           CSP KSP for delayed bleeding           Study or Subgroup         Events Total Events Total Weight M-H, Fixed, 95% CI Year         M-H, Fixed, 95% CI Year         M-H, Fixed, 95% CI A B C D E F G           Study or Subgroup         Events Total Events Total Weight         M-H, Fixed, 95% CI Year         M-H, Fixed, 95% CI A B C D E F G           Parolis CSP         M-H, Fixed, 95% CI Year         M-H, Fixed, 95% CI A B C D E F G         Parolis CSP         Parolis CSP         Risk Ratio         Risk of Bias         Bias         Difter State         Parolis CSP         Parolis CSP         Parolis CSP         Parolis CSP         Parolis CSP         Parolis CSP         Risk of Bias         State         CSP         Risk of Bias         Bias         CSP         M-H, Fixed, 95% CI         A B C D E F G         Parolis CSP										
CSP         HSP         Risk Ratio         Risk Ratio         Risk Ratio         Risk of Bias           Study or Subgroup         Events         Total         Events         Total         Weight         M-H, Fixed, 95% CI         Year         A B C D E F G           Paspatis (3-8mm)         0         206         Not estimable         2011         Image: Comparison of the Comparison of	Sociol oreidil elleot. Z	0.10 (	0.000						Favours CSP Favours CFP	
CSP         HSP         Risk Ratio										
CSP         HSP         Risk Ratio	. CSP vs H	ISP	for	del	ave	ed b	leedina			
Study or Subgroup         Events         Total         Events         Total         Weight         M-H, Fixed, 95% Cl         A B C D E F G           Paspatis (3-8mm)         0         026         Not estimable         2011         Image: Control of the standard of the sta				2012/02/201						
Paspatis (3-8mm)         0         208         0         206         Not estimable         2011         Image: Constraint of the standard of the standar	Study or Subgroup					Weight		Year		
chise (≤8mm)         0         40         0         Not estimable         2011         ●									men, rixeu, 35% GI	
Jorduch (\$10mm)         0         35         5         35         69.0%         0.09 (0.01, 1.58)         2014         Image: Constraint of the set mable         2015         Image: Constraint of the set mable         Image: Constraint of the set mable         2015         Image: Constraint of the set mable         Image: Constraint of the set mable         2015         Image: Constraint of the set mable         <				0						
Gomez (<6mm)         0         23         0         18         Not estimable         2015         Image: Comparison of the c				-			Not estimable	2011		
Kawamura (4-9mm)         0         394         2         402         31.0%         0.20 [0.01, 4.24]         2018         ■         ● <td>chise (≤8mm)</td> <td>0</td> <td>40</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	chise (≤8mm)	0	40							
Suzuki (≤10mm)         0         25         0         27         Not estimable         2018         ●         <	chise (≤8mm) Horiuchi (≤10mm)	0	40 35	5	35	69.0%	0.09 [0.01, 1.58]	2014		
Papastergiou (6-10mm) 0 84 0 83 Not estimable 2018 🕢 🐨 🙂 🐨 🐨	chise (≤8mm) Horiuchi (≤10mm) Gornez (<6mm)	0	40 35 23	5	35 18	69.0%	0.09 [0.01, 1.58] Not estimable	2014 2015		
	lchise (≤8mm) Horiuchi (≤10mm) Gomez (<6mm) Kawamura (4-9mm)	000000000000000000000000000000000000000	40 35 23 394	5 0 2	35 18 402	69.0%	0.09 [0.01, 1.58] Not estimable 0.20 [0.01, 4.24]	2014 2015 2018		
	lchise (≤8mm) Horiuchi (≤10mm) Gomez (<6mm) Kawamura (4-9mm)	000000000000000000000000000000000000000	40 35 23 394	5 0 2	35 18 402	69.0%	0.09 [0.01, 1.58] Not estimable 0.20 [0.01, 4.24]	2014 2015 2018		
	Paspatis (3-8mm) Ichise (≤8mm) Horiuchi (≤10mm) Gomez (<6mm) Kawamura (4-9mm) Suzuki (≤10mm) Papastergiou (6-10mm)	0 0 0 0	40 35 23 394 25	5 0 2 0	35 18 402 27	69.0% 31.0%	0.09 [0.01, 1.58] Not estimable 0.20 [0.01, 4.24] Not estimable	2014 2015 2018 2018		

 Papastergiou (6-10mm)
 0
 84
 0
 83
 Not estimable
 2018

 Zhang (6-9mm)
 0
 267
 0
 258
 Not estimable
 2018

 Total (95% CI)
 1076
 1069
 100.0%
 0.13 [0.02, 0.99]
 100

 Total events
 0
 7
 7
 100
 100

 Test for overall effect: Z = 1.97 (P = 0.05)
 7
 100
 100



**Figure 4.** Forest plots of the polyp retrieval rate and delayed bleeding rate. Risk of bias legend: A, random sequence generation (selection bias); B, allocation concealment (selection bias); C, blinding of participants and personnel (performance bias); D, blinding of outcome assessment (detection bias); E, incomplete outcome data (attrition bias); F, selective reporting (reporting bias); and G, other bias.

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		Cert	ainty assessi	ment				Sur	nmary of findi	ngs	
No. of partici-	Risk of	D'1 6 I	Indirect-	Improci	Publica-	Overall certainty	Study event rates (%)		Relative	Anticipated absolute effects	
pants (studies) Follow-up	bias	Incon- sistency	ness	Impreci- sion	tion bias	of evidence	With HSP	With CSP	effect (95% CI)	Risk with HSP	Risk difference with CSF
Incomplete	resection rate	e									
1698 (7 RCTs)	serious <sup>a</sup>	not serious	not serious	serious <sup>b</sup>	none <sup>c</sup>		41/849 (4.8%)	55/849 (6.5%)	RR 1.36 (0.92 to 2.01)	5 per 100 3 per	population 2 more per 100 (from 0 fewer to 4 more) ( Low 1 more
										100 <sup>d</sup>	per 100 (from 0 fewer to 3 more)
										11 per 100 <sup>d</sup>	High 4 more per 100 (from 1 fewer to 11 more

CI, confidence interval; RR, risk ratio

a. In all studies, the endoscopists were not blinded.

b. Few total events and small sample sizes.

c. Because there were fewer than 10 studies involved, funnel plots could not be created.

d. Regarding the incomplete resection rate, the control group risks in the 7 studies were 1.5%, 2.6%, 3.7%, 5.6%, 7.7%, 10.7%, and 15%. The second lowest from the bottom and the second highest from the top were taken as baseline estimates of "low risk" and "high risk," respectively.

e. Calculated using Review Manager version 5.3.

#### Certainty in cumulative evidence

Endoscopists were not blinded in all studies; therefore, there was a high risk of performance bias (Figure 2-4). The levels of the risk of bias for other domains were considered low or unclear. The overall risk of bias was considered serious for the GRADE system (Table 3, 4). Furthermore, the numbers of total events and sample sizes were small, even if all studies were integrated. Therefore, the imprecision domain was considered serious. Because two domains were evaluated as serious limitations in the GRADE system, the overall certainty of the evidence was evaluated as low for CSP compared with HSP and for CSP compared with CFP.

# Discussion

We showed that the incomplete resection rate for polyps  $\leq$  10 mm using CSP was not significantly different compared with that using HSP in this meta-analysis. Furthermore, the incomplete resection rate of CFP was significantly higher than that of CSP. These results are comparable with those of

a previous systematic review and meta-analysis[7-11]. However, we performed a subgroup analysis stratified by polyp size, which was not performed in previous reports. As a result, the difference between CFP and CSP was not significant for polyps  $\leq$ 3 mm. These results support the clinical guidelines of the European Society of Gastrointestinal Endoscopy that suggest that CSP is recommended for small polyps and CFP may be used only for polyps 1-3 mm[35].

The incomplete resection rate of CSP tended to be higher than that of HSP; however, they were not significantly different. This seems to be because HSP is a procedure that uses electrocoagulation and is advantageous for complete eradication because of its burning effect. However, heterogeneity between CSP and HSP studies was moderate ( $I^2 =$ 50% in RR analysis). Zhang et al.[26] reported that HSP is more favorable than CSP (RR, 5.75; 95% CI, 1.72-19.21) for complete resection; their randomized controlled trial was large (n = 415), however, it seemed to have a high risk of bias. We also reported a large-scale randomized controlled trial (n = 687) in which the results showed no statistical significance regarding the complete resection rates for CSP and

<b>Table 4.</b> CSP Compared with CFP for Diminutive	e Polyps.
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		Cert	ainty assessi	ment				Sur	nmary of find	ings	
No. of partici-	<b>D</b> 11 0	Incon-	т. т.1'	Turner d'	Publica-	Overall	Study ev (9	rent rates	Relative	Anticipated absolute effects	
pants (studies) Follow-up	Risk of bias	sistency	Indirect- ness	Impreci- sion	tion bias	certainty of evidence	With CFP	With CSP	effect (95% CI)	Risk with CFP	Risk difference with CSF
Incomplete	resection rate	e									
692 (5 RCTs)	serious <sup>a</sup>	not serious	not serious	serious <sup>b</sup>	none <sup>c</sup>		46/348 (13.2%)	23/344 (6.7%)	RR 0.50 (0.31 to 0.82)	13 per 100	population 7 fewer per 100 (from 11 fewer to 2 fewer) Low 5 fewer per 100 (from 7
											fewer to 2 fewer) High
										17 per 100 <sup>d</sup>	9 fewer per 100 (from 12 fewer to 3 fewer)

CI, confidence interval; RR, risk ratio

a. In all studies, the endoscopists were not blinded.

b. Few total events and small sample sizes.

c. Because there were fewer than 10 studies involved, funnel plots could not be created.

d. Regarding the incomplete resection rate, the control group risks in the 5 studies were 8.0%, 9.5%, 11.1%, 17.4%, and 24.1%. The second lowest from the bottom and the second highest from the top were taken as baseline estimates of "low risk" and "high risk," respectively.

e. Calculated using Review Manager version 5.

HSP[13]. However, there were inconsistencies between the results of the two large-scale randomized controlled trials[13,26]. Other small studies[14,15,25,28,33] have shown no statistical significance and the risk of bias was high. Therefore, the statistical differences may change if further studies with a low risk of bias are performed.

Dedicated snares for CSP were not used in many studies, and it is possible that the CSP procedure itself was highly variable among studies. It has been reported that the use of a dedicated snare may contribute to improved incomplete resection rates[36]; therefore, the type of snare used in the studies may affect the results.

The size of polyps in studies comparing CSP and CFP was smaller than in those comparing CSP and HSP. In the present meta-analysis, CSP had significantly lower incomplete resection rates compared with CFP, and there was less heterogeneity between studies. However, the polyp retrieval rate was significantly higher for CFP. If polyp retrieval is the primary outcome, then CFP may be the better procedure. However, if a "resect and discard strategy" that does not require polyp retrieval or histopathological examinations[37] is

adopted, then CSP might be the better choice because of the lower incomplete resection rate.

There was no significant difference between CSP and CFP for polyps  $\leq 3$  mm, and there was less heterogeneity between studies. Because of the aforementioned advantages of polyp retrieval with CFP, it is advantageous for polyps  $\leq 3$ mm. In this meta-analysis, there were studies of CFP that involved jumbo forceps and those that involved normal biopsy forceps. However, a randomized controlled trial showed the superior performance of jumbo biopsy forceps compared with standard biopsy forceps for the eradication of small polyps[38]. Furthermore, the most recent randomized controlled trial[29] that compared CSP with CFP using jumbo biopsy forceps showed comparative incomplete resection rates for both procedures when polyps were  $\leq 5$  mm; therefore, jumbo forceps might contribute to better removal rates for polyps  $\leq 5$  mm.

As indicated in this systematic review, the delayed bleeding rate of CSP is extremely low. It has also been reported that the delayed bleeding rate of CSP was significantly lower than that of HSP for anticoagulated patients[15]. If the difference in incomplete resection rates for these methods is not large, then the safer procedure should be chosen. Therefore, we recommend CSP rather than HSP for the treatment of polyps  $\leq 10$  mm because of its lower delayed bleeding rate.

In the present study, the analysis focused only on the polyp size. However, it should be avoided to decide the indication of CSP only by the size of the polyp. Lesions with advanced histology are present even if the polyp is <10 mm, and it is important to carefully diagnose endoscopically before resection. CSP could be disadvantageous compared with HSP to obtain submucosal tissue[14,39]. In order to avoid performing CSP for small invasive cancer, endoscopic diagnosis before resection is important.

This study had several limitations. First, CP has only been actively researched in recent years; therefore, there were insufficient studies on CP to create funnel plots to evaluate publication bias. Furthermore, non-English language papers were not evaluated. Second, it is challenging to endoscopically measure the exact polyp size. Usually, we compare polyps using the snare or forceps when we estimate the polyp size; however, this estimation may vary among endoscopists. Third, there could be a difference in the costeffectiveness of CP and other procedures, but we could not evaluate it. Finally, methods of measuring incomplete resection rates, as a primary endpoint of this study, varied among studies.

Despite these limitations, we believe this meta-analysis showed the usefulness of CP for polyps  $\leq 10$  mm. From the viewpoint of resection ability, CSP had non-inferior performance compared to HSP for polyps  $\leq 10$  mm. Because of its safety profile, CSP should be recommended for polyps  $\leq$ 10 mm. When polyp retrieval is the main outcome, CFP may be considered for polyps  $\leq 3$  mm.

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#### Conflicts of Interest

Takuji Kawamura received a research grant from Boston Scientific for the previous study. This meta-analysis was self-funded.

# Author Contributions

TK: study concept and design, acquisition of data, analysis and interpretation of data, and drafting of the manuscript. YT: acquisition of data, analysis and interpretation of data, critical revision of the manuscript for important intellectual content. NT: critical revision of the manuscript for important intellectual content, study supervision. IY: statistical review. All authors approved the final version of this manuscript.

### Approval by Institutional Review Board (IRB) N/A

#### References

- Zauber AG, Winawer SJ, O'Brien MJ, et al. Colonoscopic polypectomy and long-term prevention of colorectal-cancer deaths. N Engl J Med. 2012 Feb; 366(8): 687-96.
- Brenner H, Chang-Claude J, Seiler CM, et al. Protection from colorectal cancer after colonoscopy: a population-based, case-control study. Ann Intern Med. 2011 Jan; 154(1): 22-30.
- Nishihara R, Wu K, Lochhead P, et al. Long-term colorectalcancer incidence and mortality after lower endoscopy. N Engl J Med. 2013 Sep; 369(12): 1095-105.
- **4.** Repici A, Hassan C, Vitetta E, et al. Safety of cold polypectomy for <10mm polyps at colonoscopy: a prospective multicenter study. Endoscopy. 2012 Jan; 44(1): 27-31.
- Singh N, Harrison M, Rex DK. A survey of colonoscopic polypectomy practices among clinical gastroenterologists. Gastrointest Endosc. 2004 Sep; 60(3): 414-8.
- Tappero G, Gaia E, De Giuli P, et al. Cold snare excision of small colorectal polyps. Gastrointest Endosc. 1992 May-Jun; 38(3): 310-3.
- Shinozaki S, Kobayashi Y, Hayashi Y, et al. Efficacy and safety of cold versus hot snare polypectomy for resecting small colorectal polyps: Systematic review and meta-analysis. Dig Endosc. 2018 Sep; 30(5): 592-9.
- Qu J, Jian H, Li L, et al. Effectiveness and safety of cold versus hot snare polypectomy: A meta-analysis. J Gastroenterol Hepatol. 2019 Jan; 34(1): 49-58.
- Fujiya M, Sato H, Ueno N, et al. Efficacy and adverse events of cold vs hot polypectomy: A meta-analysis. World J Gastroenterol. 2016 Jun; 22(23): 5436-44.
- 10. Jung YS, Park CH, Nam E, et al. Comparative efficacy of cold polypectomy techniques for diminutive colorectal polyps: a systematic review and network meta-analysis. Surg Endosc. 2018 Mar; 32(3): 1149-59.
- Raad D, Tripathi P, Cooper G, et al. Role of the cold biopsy technique in diminutive and small colonic polyp removal: a systematic review and meta-analysis. Gastrointest Endosc. 2016 Mar; 83(3): 508-15.
- 12. https://www.crd.york.ac.uk/PROSPERO.
- 13. Kawamura T, Takeuchi Y, Asai S, et al. A comparison of the resection rate for cold and hot snare polypectomy for 4-9 mm colorectal polyps: a multicentre randomised controlled trial (CRES-CENT study). Gut. 2018 Nov; 67(11): 1950-7.
- 14. Suzuki S, Gotoda T, Kusano C, et al. Width and depth of resection for small colorectal polyps: hot versus cold snare polypectomy. Gastrointest Endosc. 2018 Apr; 87(4): 1095-103.

- 15. Horiuchi A, Nakayama Y, Kajiyama M, et al. Removal of small colorectal polyps in anticoagulated patients: a prospective randomized comparison of cold snare and conventional polypectomy. Gastrointest Endosc. 2014 Mar; 79(3): 417-23.
- 16. Shimodate Y, Mizuno M, Takezawa R, et al. Safety of cold polypectomy for small colorectal neoplastic lesions: a prospective cohort study in Japan. Int J Colorectal Dis. 2017 Sep; 32(9): 1261-6.
- Schett B, Wallner J, Weingart V, et al. Efficacy and safety of cold snare resection in preventive screening colonoscopy. Endoscopy Int Open. 2017 Jul; 5(7): E580-6.
- Higgins JP, Altman DG, Gotzsche PC, et al. The Cochrane Collaboration's tool for assessing risk of bias in randomised trials. BMJ. 2011 Oct; 343: d5928.
- Guyatt G, Oxman AD, Akl EA, et al. GRADE guidelines: 1. Introduction-GRADE evidence profiles and summary of findings tables. J Clin Epidemiol. 2011 Apr; 64(4): 383-94.
- 20. Arimoto J, Chiba H, Ashikari K, et al. Safety of Cold Snare Polypectomy in Patients Receiving Treatment with Antithrombotic Agents. Dig Dis Sci. 2019 Nov; 64(11): 3247-55.
- 21. Din S, Ball AJ, Taylor E, et al. Polypectomy practices of subcentimeter polyps in the English Bowel Cancer Screening Programme. Surg Endosc. 2015 Nov; 29(11): 3224-30.
- 22. Komeda Y, Kashida H, Sakurai T, et al. Removal of diminutive colorectal polyps: A prospective randomized clinical trial between cold snare polypectomy and hot forceps biopsy. World J Gastroenterol. 2017 Jan; 23(2): 328-35.
- 23. Din S, Ball AJ, Riley SA, et al. A randomized comparison of cold snare polypectomy versus a suction pseudopolyp technique. Endoscopy. 2015 Nov; 47(11): 1005-10.
- 24. Aslan F, Camci M, Alper E, et al. Cold snare polypectomy versus hot snare polypectomy in endoscopic treatment of small polyps. Turk J Gastroenterol. 2014 Jun; 25(3): 279-83.
- 25. Papastergiou V, Paraskeva KD, Fragaki M, et al. Cold versus hot endoscopic mucosal resection for nonpedunculated colorectal polyps sized 6-10 mm: a randomized trial. Endoscopy. 2018 Apr; 50 (4): 403-11.
- 26. Zhang Q, Gao P, Han B, et al. Polypectomy for complete endoscopic resection of small colorectal polyps. Gastrointest Endosc. 2018 Mar; 87(3): 733-40.
- 27. Paspatis GA, Tribonias G, Konstantinidis K, et al. A prospective randomized comparison of cold vs hot snare polypectomy in the occurrence of postpolypectomy bleeding in small colonic polyps. Colorectal Dis. 2011 Oct; 13(10): e345-8.
- **28.** Ichise Y, Horiuchi A, Nakayama Y, et al. Prospective randomized comparison of cold snare polypectomy and conventional polypectomy for small colorectal polyps. Digestion. 2011; 84(1): 78-81.

- **29.** Huh CW, Kim JS, Choi HH, et al. Jumbo biopsy forceps versus cold snares for removing diminutive colorectal polyps: A prospective randomized controlled trial. Gastrointest Endosc. 2019 Jul; 90 (1): 105-11.
- **30.** Park SK, Ko BM, Han JP, et al. A prospective randomized comparative study of cold forceps polypectomy by using narrow-band imaging endoscopy versus cold snare polypectomy in patients with diminutive colorectal polyps. Gastrointest Endosc. 2016 Mar; 83 (3): 527-32.
- **31.** Kim JS, Lee BI, Choi H, et al. Cold snare polypectomy versus cold forceps polypectomy for diminutive and small colorectal polyps: a randomized controlled trial. Gastrointest Endosc. 2015 Mar; 81(3): 741-7.
- 32. Lee CK, Shim JJ, Jang JY. Cold snare polypectomy vs. Cold forceps polypectomy using double-biopsy technique for removal of diminutive colorectal polyps: a prospective randomized study. Am J Gastroenterol. 2013 Oct; 108(10): 1593-600.
- **33.** Gomez V, Badillo RJ, Crook JE, et al. Diminutive colorectal polyp resection comparing hot and cold snare and cold biopsy forceps polypectomy. Results of a pilot randomized, single-center study (with videos). Endoscopy Int Open. 2015 Feb; 3(1): E76-80.
- 34. Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0. https://handbook-5-1.cochrane.org/. (Higgins JP, Green S, editors.). https://handbook-5-1.cochrane.org/.
- 35. Ferlitsch M, Moss A, Hassan C, et al. Colorectal polypectomy and endoscopic mucosal resection (EMR): European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline. Endoscopy. 2017 Mar; 49(3): 270-97.
- 36. Horiuchi A, Hosoi K, Kajiyama M, et al. Prospective, randomized comparison of 2 methods of cold snare polypectomy for small colorectal polyps. Gastrointest Endosc. 2015 Oct; 82(4): 686-92.
- 37. Ignjatovic A, East JE, Suzuki N, et al. Optical diagnosis of small colorectal polyps at routine colonoscopy (Detect InSpect ChAracterise Resect and Discard; DISCARD trial): a prospective cohort study. Lancet Oncol. 2009 Dec; 10(12): 1171-8.
- **38.** Draganov PV, Chang MN, Alkhasawneh A, et al. Randomized, controlled trial of standard, large-capacity versus jumbo biopsy forceps for polypectomy of small, sessile, colorectal polyps. Gastrointest Endosc. 2012 Jan; 75(1): 118-26.
- 39. Shichijo S, Takeuchi Y, Kitamura M, et al. Does cold snare polypectomy completely resect the mucosal layer? A prospective single-center observational trial. J Gastroenterol Hepatol. 2020 Feb; 35(2): 241-8.

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