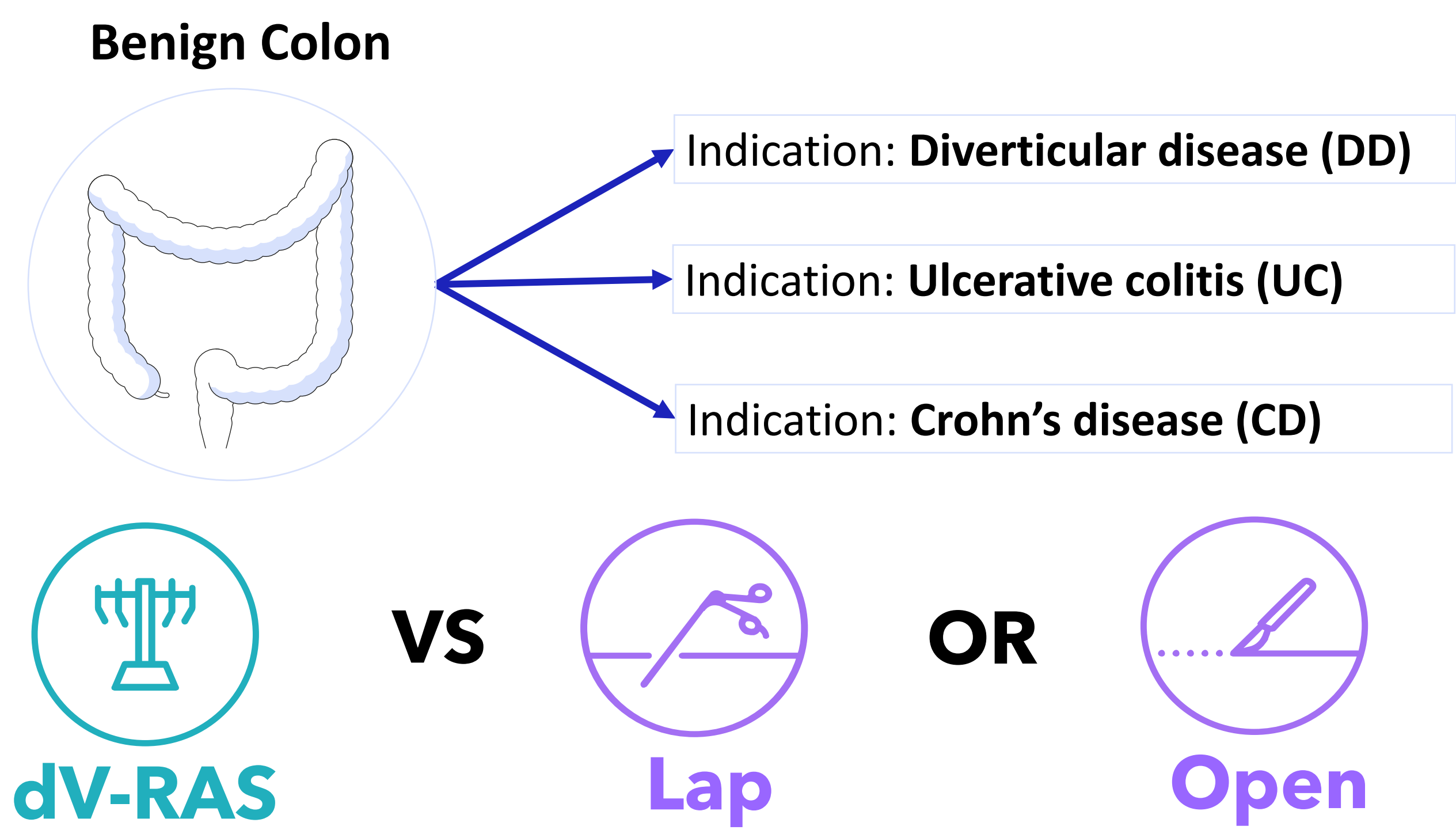


INTRODUCTION

- Despite the growing adoption of robotic-assisted surgery with da Vinci surgical system (dV-RAS), its efficacy and effectiveness relative to laparoscopic (Lap) or Open approaches for the benign colon remains debated.
- It is essential to consolidate evidence to address existing gaps and provide a comprehensive understanding of the total practice for benign colorectal procedures.

AIM

This review and meta-analysis compare perioperative outcomes for dV-RAS, Lap or Open surgery for colectomy or proctectomy in benign colon indications.

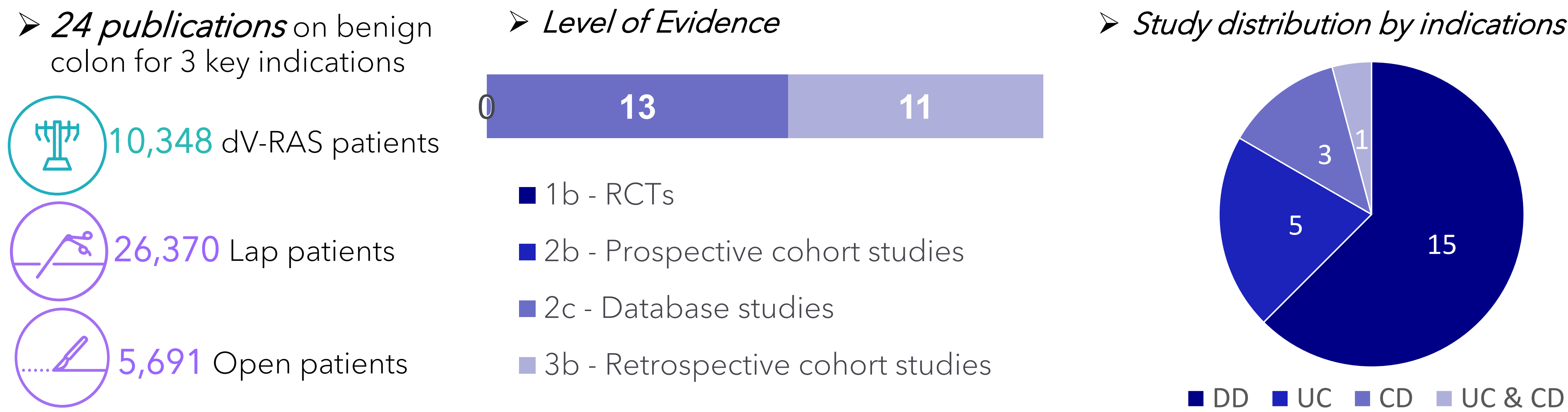


METHODS

- A PRISMA-guided review and R-based meta-analysis evaluated studies comparing dV-RAS to Lap or Open approaches for benign colon conditions, using PubMed, Embase, and Scopus searches over 14 years (January 1, 2010, to April 15, 2024)
- Studies were excluded if they were non-English, involved pediatric cases, included mixed procedures or study arms, lacked relevant outcomes, or contained redundant data.
- Procedures included in the analysis by benign indication:

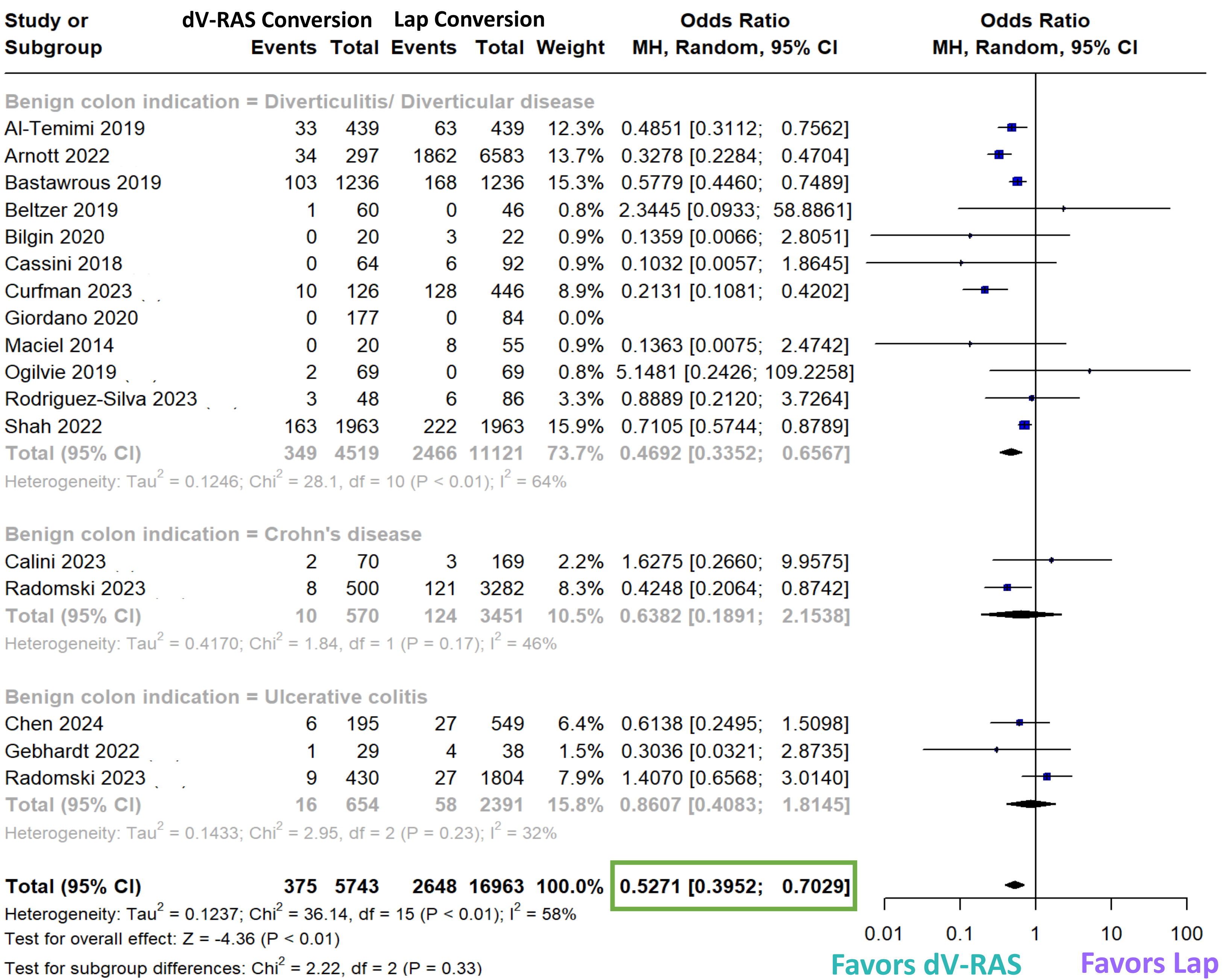
Indications	Procedures
DD	• Sigmoidectomy/Sigmoid resection
	• Left colectomy
	• Recto-sigmoid resection
	• Low anterior resection (LAR)
	• Hartmann's procedure
UC	• Total proctocolectomy with ileal pouch–anal anastomosis (TPC-IPAA)
	• Proctectomy
	• Proctectomy with IPAA
	• Proctocolectomy
	• Proctocolectomy with IPAA
CD	• Ileocolic resection
	• Ileocecal resection
	• Colectomy

RESULTS



- Compared to Lap, patients undergoing dV-RAS had :
- ↑ Operative time by 51 minutes
  - ↑ 30-day readmissions by 24%
  - ↓ Conversions by 47%
  - ↓ 30-day postoperative complications by 14%
  - ↓ Length of stay by average 0.5 days
  - All other outcomes were comparable
- Compared to Open, patients undergoing dV-RAS had :
- ↑ Operative time by 87 minutes
  - ↓ Blood transfusions by 47%
  - ↓ 30-day postoperative complications by 47%
  - ↓ Length of stay by average 2.9 days
  - ↓ Anastomotic leak by 61%
  - ↓ Ileus rate by 33%
  - All other outcomes were comparable

Figure 1. Forest plot for Conversion dV-RAS vs Lap



RESULTS

Table 1. Evidence summary: dV-RAS vs Lap

Outcomes	Studies	dV-RAS n	Lap n	Effect size	Heterogeneity	p-value	Conclusion
Operative time	19	4740	21351	MD: 50.80 [36.75; 64.84]	p<0.01; I <sup>2</sup> =97%	p<0.01	Favors LAP
Conversions	17	5743	16963	OR: 0.53 [0.39; 0.70]	0.01; I <sup>2</sup> =58%	p<0.01	Favors dV-RAS
Blood transfusions	10	4109	15892	OR: 0.88 [0.63; 1.23]	p=0.04; I <sup>2</sup> =50%	p=0.46	Comparable
Length of stay	17	4559	18057	MD: -0.54 [-0.79; -0.29]	p<0.01; I <sup>2</sup> =96%	p<0.01	Favors dV-RAS
Surgical site infection	16	4484	19724	OR: 1.00 [0.75; 1.33]	p<0.01; I <sup>2</sup> =67%	p=1.00	Comparable
Anastomotic leak	16	3396	20357	OR: 1.04 [0.80; 1.36]	p=0.04; I <sup>2</sup> =42%	p=0.78	Comparable
Ileus rate	14	4350	21005	OR: 0.87 [0.65; 1.15]	p<0.01; I <sup>2</sup> =73%	p=0.33	Comparable
30-day complications	12	3241	7820	OR: 0.86 [0.77; 0.96]	p=0.28; I <sup>2</sup> =17%	p<0.01	Favors dV-RAS
30-day readmissions	12	3243	16830	OR: 1.24 [1.09; 1.40]	p=0.59; I <sup>2</sup> =0%	p<0.01	Favors LAP
30-day reoperations	15	3422	19996	OR: 0.99 [0.81; 1.20]	p=0.84; I <sup>2</sup> =0%	p=0.91	Comparable
30-day mortality	13	4275	17921	OR: 1.07 [0.59; 1.95]	p=0.83; I <sup>2</sup> =0%	p=0.82	Comparable

Table 2. Evidence summary: dV-RAS vs Open

Outcomes	Studies	dV-RAS n	Open n	Effect size	Heterogeneity	p-value	Conclusion
Operative time	6	1605	3739	MD: 86.68 [48.93; 124.42]	p<0.01; I <sup>2</sup> =98%	p<0.01	Favors Open
Blood transfusions	2	1244	1263	OR: 0.37 [0.24; 0.57]	p=0.99; I <sup>2</sup> =0%	p<0.01	Favors dV-RAS
Length of stay	5	1484	1903	MD: -2.85 [-4.84; -0.87]	p<0.01; I <sup>2</sup> =84%	p<0.01	Favors dV-RAS
Surgical site infection	5	1529	2179	OR: 0.84 [0.67; 1.05]	p=0.72; I <sup>2</sup> =0%	p=0.13	Comparable
Anastomotic leak	4	493	4364	OR: 0.39 [0.19; 0.80]	p=0.67; I <sup>2</sup> =0%	p=0.01	Favors dV-RAS
Ileus rate	5	1524	3569	OR: 0.67 [0.54; 0.82]	p=0.17; I <sup>2</sup> =37%	p<0.01	Favors dV-RAS
30-day complications	3	1352	1371	OR: 0.53 [0.45; 0.63]	p=0.19; I <sup>2</sup> =40%	p<0.01	Favors dV-RAS
30-day readmissions	2	321	660	OR: 1.02 [0.70; 1.49]	p=0.96; I <sup>2</sup> =0%	p=0.90	Comparable
30-day reoperations	3	367	2412	OR: 0.83 [0.48; 1.42]	p=0.69; I <sup>2</sup> =0%	p=0.49	Comparable
30-day mortality	4	1478	1817	RD: -0.0002 [-0.0047; 0.0044]	p=1.00; I <sup>2</sup> =0%	p=0.95	Comparable

CONCLUSIONS

- Our review and analysis suggest that da Vinci surgical system is a feasible and safe option for benign colon surgery.
- Most publications in our meta-analysis focused on DD. Additional research on UC and CD are needed to confirm our findings.

TABLES & REFERENCES



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