

Colonic tumours at the flexure and in Lynch syndrome : segmental or extended surgery ?



Pr Eddy COTTE

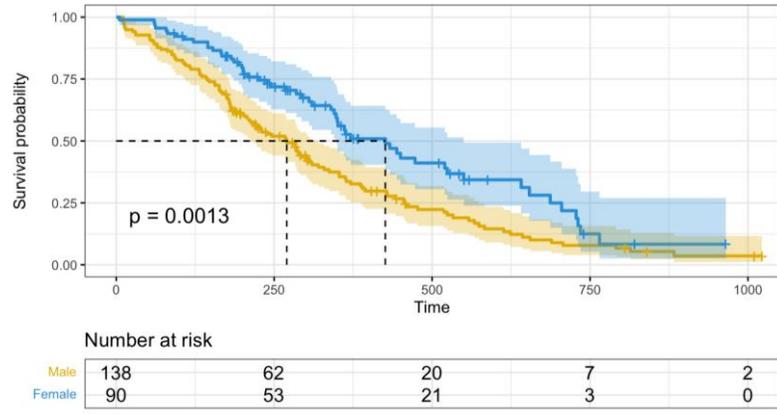
Lyon-Sud University Hospital

France



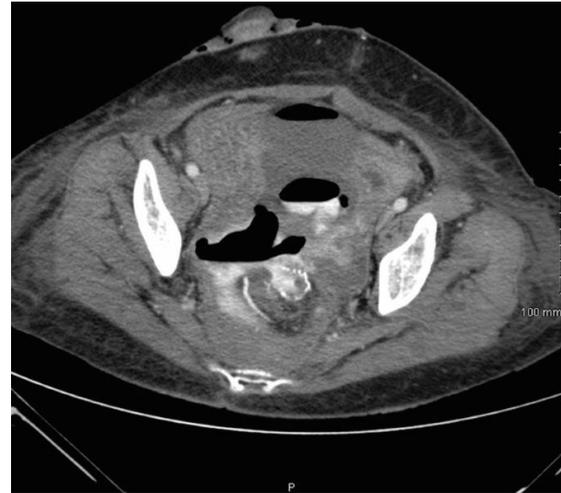
What are the issues ?

What are the issues ?



Oncological results

Risk of metachronous colon cancer



Post-op morbidity



Functional results/QOL

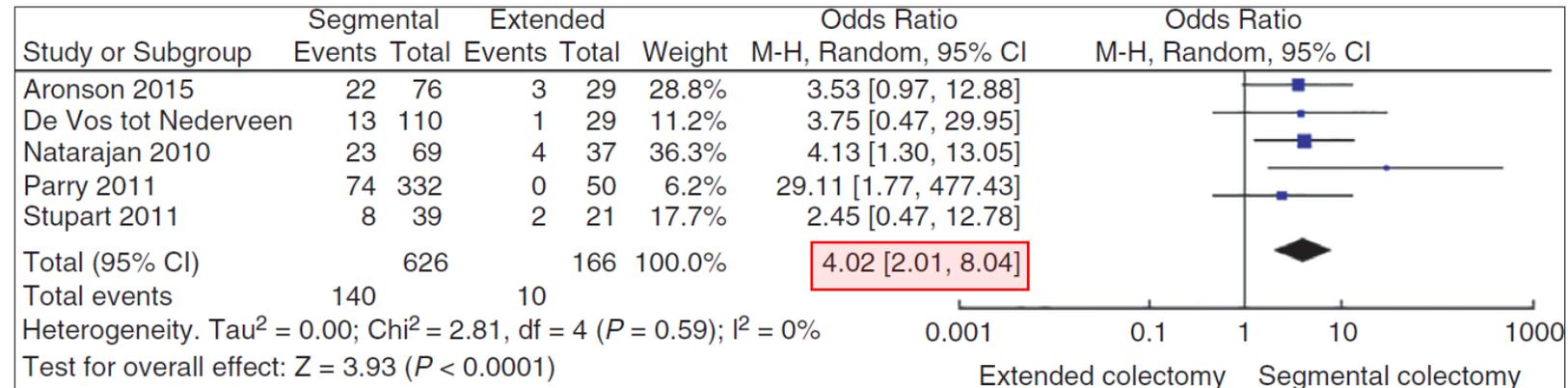
Risk of metachronous colorectal cancer following colectomy in Lynch syndrome: a systematic review and meta-analysis

C. C. Anele*[†] , S. O. Adegbola*[†], A. Askari[‡], A. Rajendran[§], S. K. Clark*[†], A. Latchford[§] and O. D. Faiz*[†]

*Department of Surgery and Cancer, Imperial College London, London, UK, [†]St Mark's Hospital and Academic Institute, Middlesex, UK, [‡]Surgical Epidemiology Trials and Outcomes Centre, St Mark's Hospital and Academic Institute, Middlesex, UK, and [§]Department of Gastroenterology, St Mark's Hospital and Academic Institute, Middlesex, UK

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- Meta-analysis
- 6 studies
- n=871 patients
- 705 Seg Col vs 166 Ext Col
- Mean FU=7.6 years



- The mCRC rate was **22.8%** after Seg Col vs **6%** after Ext Col
- Despite 1-2 yearly endoscopic surveillance

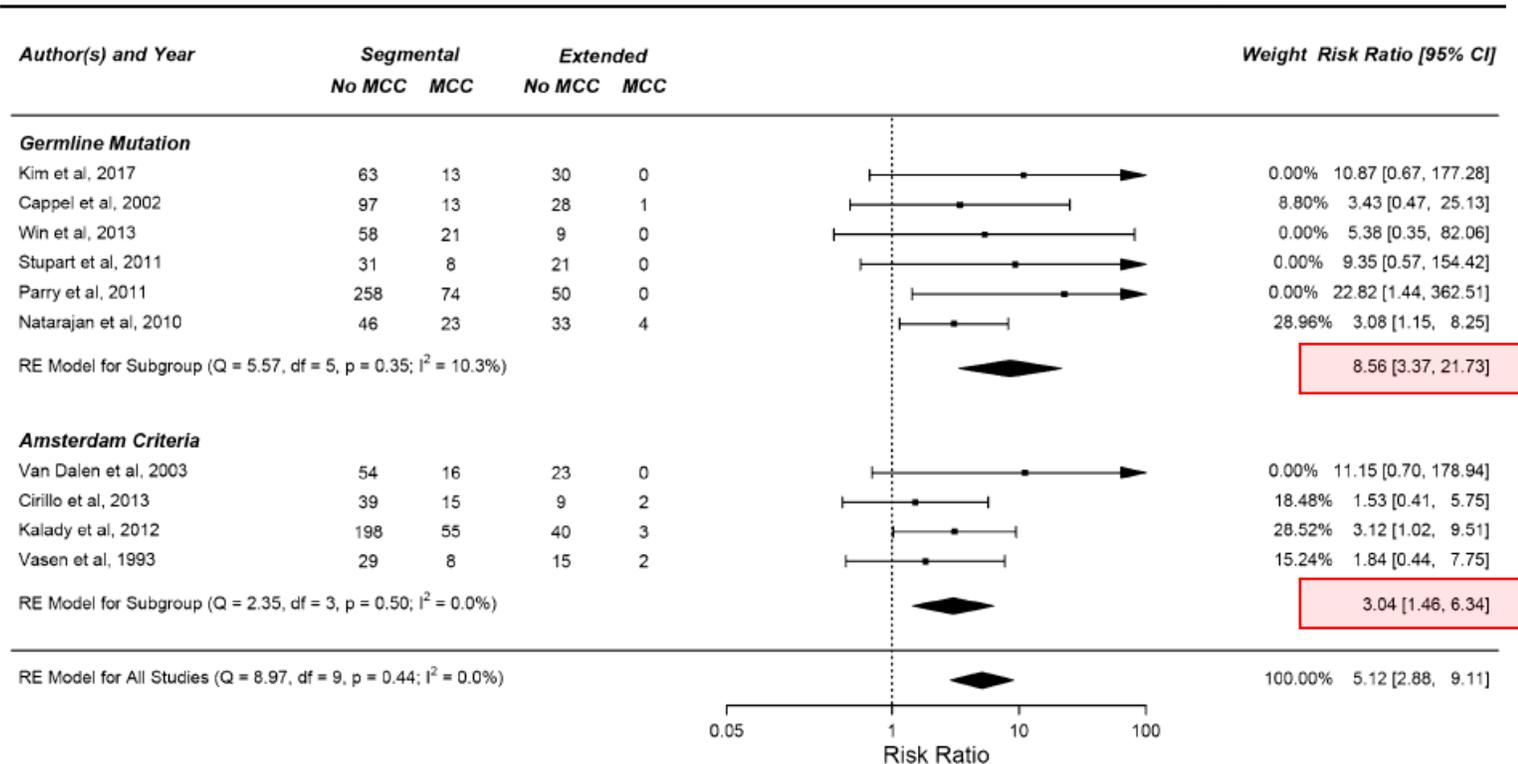


Metachronous colorectal cancer following segmental or extended colectomy in Lynch syndrome: a systematic review and meta-analysis

Salim S. Malik¹ · Mark P. Lythgoe¹ · Mark McPhail¹ · Kevin J. Monahan^{1,2}

- Meta-analysis
- 10 studies
- n=1389 patients Lynch or HNPCC
- 1119 Seg Col vs 270 Ext Col
- Mean FU=8.4 years

The mCRC rate was 22.7% after Seg Col vs 4.7% after Ext Col



Is the morbidity different
between segmental and
extended colectomy ?

What Is the Optimal Elective Colectomy for Splenic Flexure Cancer: End of the Debate? A Multicenter Study From the GRECCAR Group With a Propensity Score Analysis

Gilles Manceau, M.D., Ph.D.¹ • Arnaud Alves, M.D., Ph.D.² • H el ene Meillat, M.D.³
 L eonor Benha im, M.D., Ph.D.⁴ • Mehdi Ouai ssi, M.D., Ph.D.⁵ • Yves H. Panis, M.D., Ph.D.⁶
 Jean-Jacques Tuech, M.D., Ph.D.⁷ • Bertrand Dousset, M.D., Ph.D.⁸
 C ecile Brigand, M.D., Ph.D.⁹ • Eddy Cotte, M.D., Ph.D.¹⁰ • Zaher Lakkis, M.D., Ph.D.¹¹
 Bogdan Badic, M.D., Ph.D.¹² • Fr ed eric Marchal, M.D.¹³ • Charles Sabbagh, M.D., Ph.D.¹⁴
 Momar Diouf, Ph.D.¹⁵ • Mehdi Karoui, M.D., Ph.D.¹



- Mutlicenter Retrospective study
- Propensity score analysis
- n=313 splenic flexure tumors
 - 183 splenic flex colectomies
 - 57 left hemicolectomies
 - 27 subtotal colectomies

TABLE 2. Postoperative outcomes of 313 patients operated on electively for a splenic flexure tumor

Characteristics	Overall cohort, n (%) n = 313	Splenic flexure colectomy, n (%) n = 183	Left hemicolectomy, n (%) n = 57	Subtotal colectomy, n (%) n = 73	p value
Postoperative death					0.85
Yes	6 (2)	3 (2)	1 (2)	2 (3)	
No	307 (98)	180 (98)	56 (98)	71 (97)	
Postoperative complication					0.97
Yes	121 (40)	69 (39)	23 (41)	29 (40)	
No	183 (60)	107 (61)	33 (59)	43 (60)	
Medical morbidity	75 (25)	38 (22)	15 (27)	22 (31)	0.31
Urinary tract infection	19 (6)	10 (6)	4 (7)	5 (7)	0.85
Pulmonary complication	25 (8)	11 (6)	6 (11)	8 (11)	0.34
Cardiac complication	16 (5)	8 (5)	1 (2)	7 (10)	0.13
DVT/PE	3 (1)	2 (1)	1 (2)	0	0.57
Postoperative delirium	15 (5)	9 (5)	2 (4)	4 (6)	0.94
Other ^a	20 (7)	10 (6)	5 (9)	5 (7)	0.63
Surgical morbidity	83 (27)	46 (26)	14 (25)	23 (32)	0.64
Anastomotic leak	25 (8)	14 (8)	3 (5)	8 (11)	0.52
Wound complications	29 (10)	16 (9)	4 (7)	9 (12)	0.60
Hemorrhage	7 (2)	5 (3)	1 (2)	1 (1)	0.87
Unplanned reoperation	31 (10)	18 (10)	3 (5)	10 (14)	0.30
Other ^b	28 (9)	15 (9)	8 (11)	5 (9)	0.83
Clavien-Dindo ≥ 3	55 (18)	28 (16)	13 (23)	14 (19)	0.44



Clinical Practice Guidelines for the Surgical Treatment of Patients With Lynch Syndrome

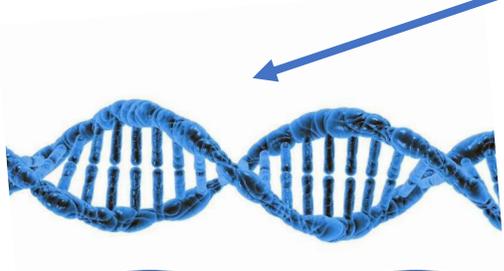
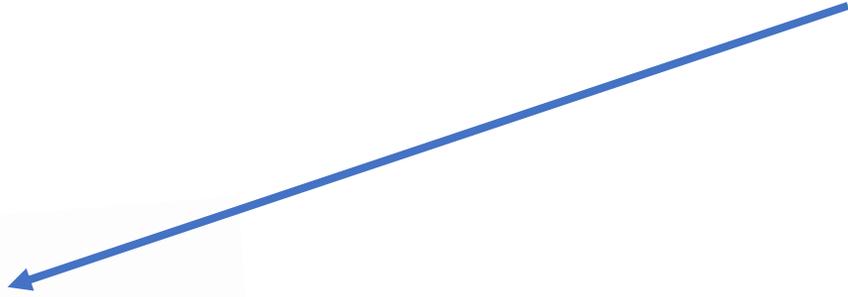
Daniel O. Herzig, M.D. • W. Donald Buie, M.D. • Martin R. Weiser, M.D.
Y. Nancy You, M.D. • Janice F. Rafferty, M.D. • Daniel Feingold, M.D.
Scott R. Steele, M.D.

Prepared on Behalf of the Clinical Practice Guidelines Committee of the American Society of Colon and Rectal Surgeons

1. For individuals with Lynch syndrome who develop a colon cancer, a **total colectomy** is preferred for cancer risk reduction. **Strong recommendation** based on moderate-quality evidence. **1B**





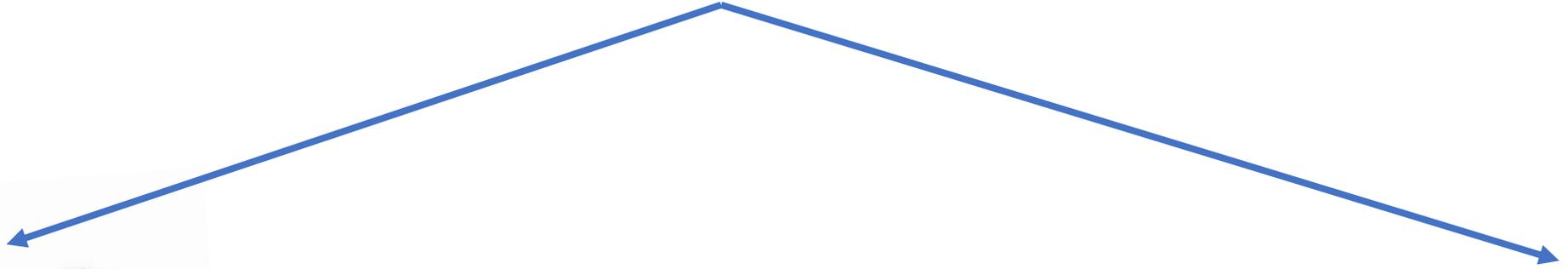


MLH1

MSH2

MSH6

PMS2



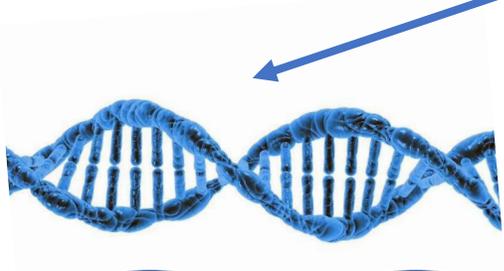
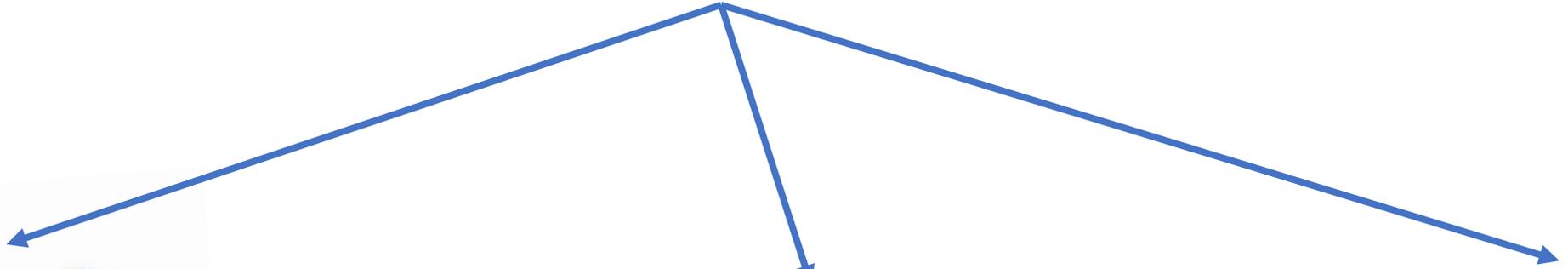
MLH1

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MLH1

MSH2

MSH6

PMS2





Functional results and QOL

Segmental vs. Extended Colectomy: Measurable Differences in Morbidity, Function, and Quality of Life

Y. Nancy You, M.D., M.H.Sc.¹ • Heidi K. Chua, M.D.¹ • Heidi Nelson, M.D.¹ • Imran Hassan, M.D.² • Sunni A. Barnes, Ph.D.³ • Jeffrey Harrington, M.A.³

VOLUME 51: 1036–1043 (2008)

¹ Department of Surgery, Mayo Clinic, Rochester, Minnesota

- Retrospective study
- Various indications
- **145** seg col vs **42** Subtotal col vs **56** total colectomies

	SEG (n=145)	STC-ISA (n=42)	TC-IRA (n=56)	<i>P value</i>		
				SEG vs. STC-ISA	SEG vs. TC-IRA	STC-ISA vs. TC-IRA
Bowel frequency						
Day	<u>2</u> (1–3)	<u>3</u> (2–4)	<u>4</u> (3–8)	<0.001	<0.001	0.0022
Night	<u>0</u> (0–0)	<u>1</u> (0–1)	<u>1</u> (1–2)	<0.001	<0.001	0.0019

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Table 5. Quality of life after surgery, as measured by the IBS-QOL questionnaire

	SEG (n=145)	STC-ISA (n=42)	TC-IRA (n=56)	<i>P</i> value		
				SEG vs. STC-ISA	SEG vs. TC-IRA	STC-ISA vs. TC-IRA
Overall	98.5 (93.4, 100)	94.9 (87.5, 99.3)	91.2 (84.6, 96.3)	0.003	<0.001	0.16
Dysphoria	100 (96.9, 100)	100 (90.6, 100)	96.9 (90.6, 100)	0.047	<0.001	0.28
Interfere with activity	100 (89.3, 100)	89.3 (76.7, 96.4)	85.7 (71.4, 92.9)	<0.001	<0.001	0.15
Body image	100 (93.8, 100)	100 (87.5, 100)	100 (87.5, 100)	0.32	0.15	0.82
Health worry	100 (91.7, 100)	100 (83.3, 100)	91.7 (83.3, 100)	0.53	0.028	0.28
Food avoidance	100 (91.7, 100)	91.7 (75, 100)	83 (66.7, 91.7)	<0.001	<0.001	0.31
Social reaction	100 (93.8, 100)	100 (93.8, 100)	100 (87.5, 100)	0.062	0.036	0.97
Sexual activity	100 (100, 100)	100 (100, 100)	100 (100, 100)	0.28	0.16	0.91
Relationships	100 (100, 100)	100 (91.7, 100)	100 (91.7, 100)	0.58	0.33	0.79

SEG=segmental resection; STC-ISA=subtotal colectomy with ileosigmoid anastomosis; TC-IRA=total colectomy with ileorectal anastomosis. • Data are medians with interquartile ranges in parentheses unless otherwise indicated.

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There is a real difference between segmental and extended colectomies with more comfort and better QOL after segmental colectomies.

Table 5. Quality of life after surgery, as measured by the

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			SEG vs. STC-ISA	SEG vs. TC-IRA	STC-ISA vs. TC-IRA
Overall	94.9 (87.5, 99.3)	91.2 (84.6, 96.3)	0.003	<0.001	0.16
Stool frequency	100 (90.6, 100)	96.9 (90.6, 100)	0.047	<0.001	0.28
Stool urgency	89.3 (89.3, 100)	85.7 (71.4, 92.9)	<0.001	<0.001	0.15
Stool control	100 (93.8, 100)	100 (87.5, 100)	0.32	0.15	0.82
Stool consistency	100 (91.7, 100)	91.7 (83.3, 100)	0.53	0.028	0.28
Food avoidance	100 (91.7, 100)	91.7 (75, 100)	<0.001	<0.001	0.31
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MLH1

MSH2

MSH6

PMS2

Oncological risk / mutation

European guidelines from the EHTG and ESCP for Lynch syndrome: an updated third edition of the Mallorca guidelines based on gene and gender

BJS, 2021, 108, 484–498

T. T. Seppälä ^{1,2*}, A. Latchford^{3,4}, I. Negoï¹¹, A. Sampaio Soares¹², R. Jimenez-Rodriguez ¹³, L. Sánchez-Guillén ¹⁴, D. G. Evans⁵, N. Ryan^{6,7}, E. J. Crosbie⁶, M. Dominguez-Valentin¹⁵, J. Burn⁸, M. Kloor^{16,17}, M. von Knebel Doeberitz^{16,17}, F. J. B. van Duijnhoven²⁰, P. Quirke⁹, J. R. Sampson¹⁰, P. Møller^{15,19}, G. Möslein^{18,19}, on behalf of the European Hereditary Tumour Group (EHTG) and European Society of Coloproctology (ESCP)

Table 3 Studies describing the cumulative incidence of colorectal cancer in patients with Lynch syndrome

Reference	Gender	70-year cumulative incidence (%)			
		MLH1	MSH2	MSH6	PMS2
Bonadona <i>et al.</i> ³⁸	Both	41	48	12	
Dowty <i>et al.</i> ³⁶	Men	34	47		
	Women	36	37		
ten Broeke <i>et al.</i> ³⁷	Men				13*
	Women				12*
PLSD ⁶	Men	53	42	18	10
	Women	44	46	20	10

*Cumulative risk at 80 years. PLSD, Prospective Lynch Syndrome Database.

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For a *path_MLH1* or *path_MSH2* carrier with a first colonic cancer, extended surgery with ileosigmoidal/ileorectal anastomosis is preferable to standard resection to reduce the risk of metachronous colorectal cancer.

For a *path_MSH6* or *path_PMS2* pathogenic variant carrier with a first colonic cancer, standard/segmental colonic resection should be offered.



OPEN ACCESS

Gut 2020;69:411–444.

Guidelines for the management of hereditary colorectal cancer from the British Society of Gastroenterology (BSG)/Association of Coloproctology of Great Britain and Ireland (ACPGBI)/United Kingdom Cancer Genetics Group (UKCGG)

Kevin J Monahan ^{1,2}, Nicola Bradshaw,³ Sunil Dolwani,⁴ Bianca Desouza,⁵ Malcolm G Dunlop,⁶ James E East,^{7,8} Mohammad Ilyas,⁹ Asha Kaur,¹⁰ Fiona Laloo,¹¹ Andrew Latchford,¹² Matthew D Rutter ^{13,14}, Ian Tomlinson ^{15,16}, Huw J W Thomas,^{1,2} James Hill,¹¹ Hereditary CRC guidelines eDelphi consensus group

We suggest that for LS patients with *MLH1* or *MSH2* mutations who develop colon cancer or colonic neoplasia not amenable to endoscopic control, the decision to perform segmental versus total/near total colectomy should balance the risks of metachronous cancer, the functional consequences of surgery, the patient's age and patient's wishes. (GRADE of evidence: Moderate; Strength of recommendation: strong)

We recommend that for LS patients with *MSH6* or *PMS2* mutations there is insufficient evidence for oncological benefit of extended colectomy over segmental resection. (GRADE of evidence: low; Strength of recommendation: strong)



Age ?

COLON CANCER

Decision analysis in the surgical treatment of colorectal cancer due to a mismatch repair gene defect

W H de Vos tot Nederveen Cappel, E Buskens, P van Duijvendijk, A Cats, F H Menko, G Griffioen, J F Slors, F M Nagengast, J H Kleibeuker, H F A Vasen

Gut 2003;52:1752-1755

- **Comparison seg vs extended colectomies**
- **Markov Modelisation**
- **Primary endpoint: life expectancy**
- **Included :**
 - Risk of metachronous colorectal cancer
 - Cancer stage
 - 5-year survival rate according to cancer stage

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Table 2 Life expectancy of patients with colon cancer depending on treatment offered and age at first detection

	Life expectancy from first detection onwards		
	Age 27 y	Age 47 y	Age 67 y
Hemicolectomy overall*	31.6	20.6	10.5
Subtotal colectomy overall	33.9	21.6	10.8
Proctocolectomy overall	34.8	21.9	10.8
Hemicolectomy Dukes' A	42.4	27.4	13.7
Subtotal colectomy Dukes' A	45.8	28.9	14.1
Proctocolectomy Dukes' A	47.1	29.4	14.2
Hemicolectomy Dukes' B	29.1	19.0	9.8
Subtotal colectomy Dukes' B	31.1	19.8	10.0
Proctocolectomy Dukes' B	31.8	20.1	10.0
Hemicolectomy Dukes' C	16.9	11.3	6.2
Subtotal colectomy Dukes' C	17.6	11.6	6.2
Proctocolectomy Dukes' C	18.0	11.7	6.2

*Overall takes into account a distribution of Dukes' stages A, B, and C of 32%, 54%, and 14%, respectively.

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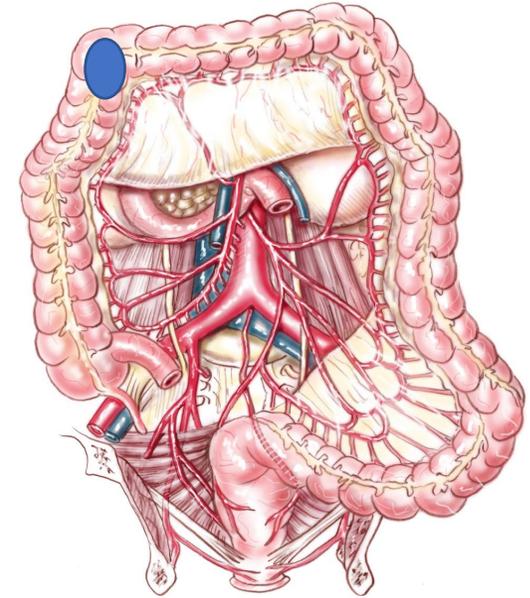
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And now for tumors at the flexure !!!



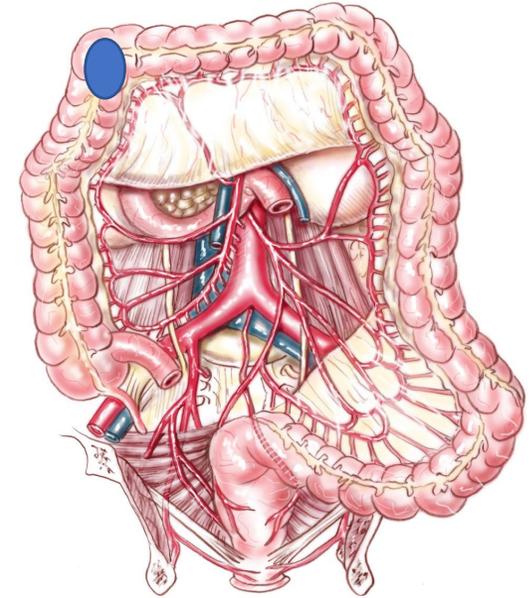
Hepatic flexure colon cancer

- **Young patients**
- **MLH1 or MSH2**



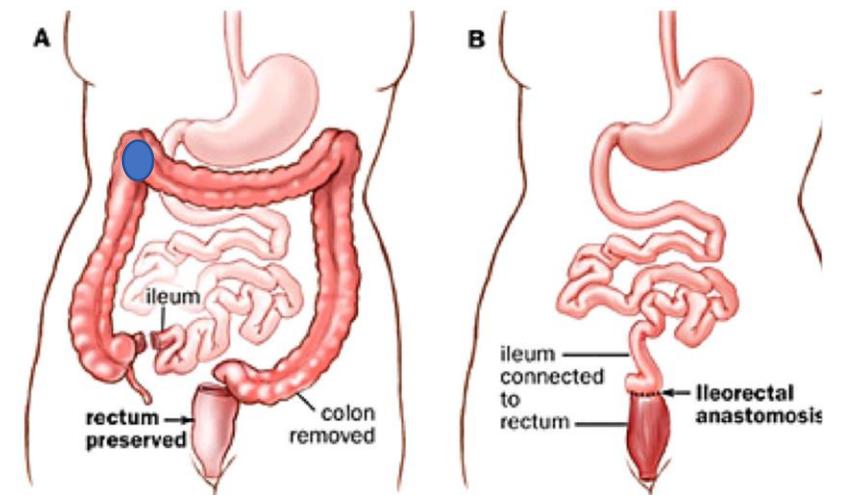
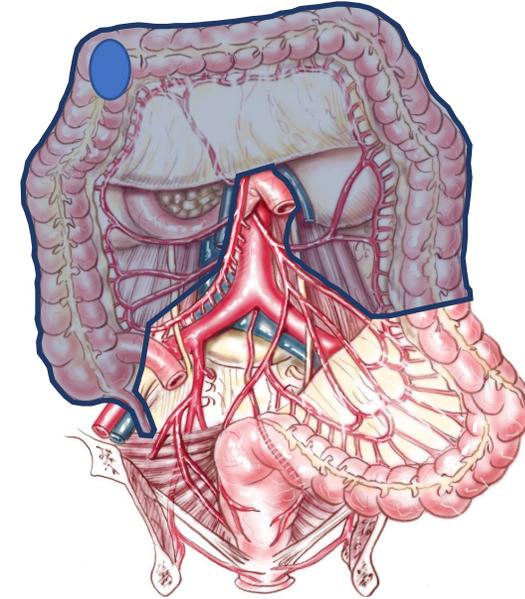
Hepatic flexure colon cancer

- Young patients
- MLH1 or MSH2



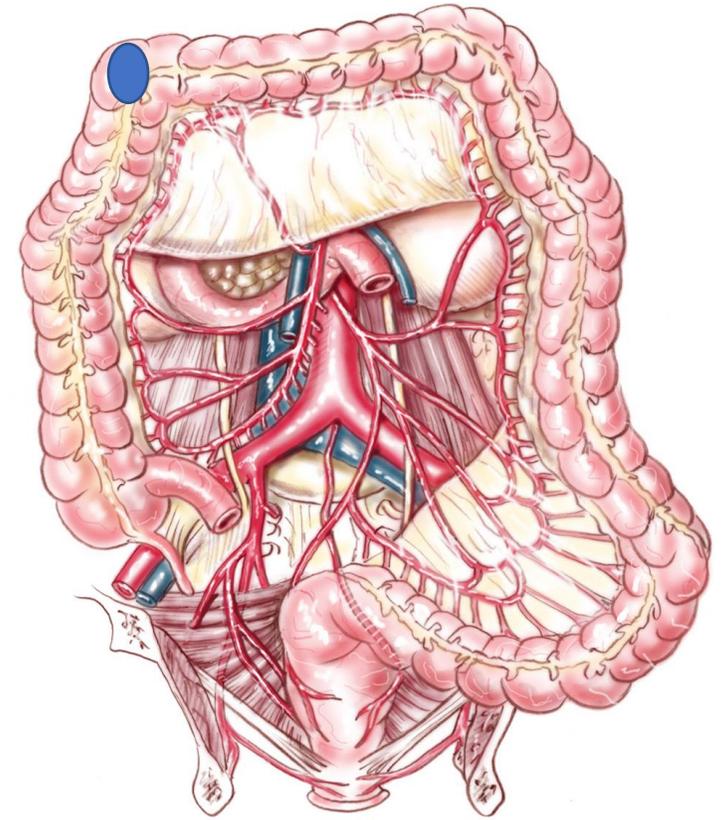
Hepatic flexure colon cancer

- Young patients
- MLH1 or MSH2
- **Extended colectomy**
 - Subtotal colectomy
 - Or total colectomy
- **Complete lymphadenectomy**
 - Right vessels
 - Middle colic Art
 - Left superior colic Art
 - +/- IMA



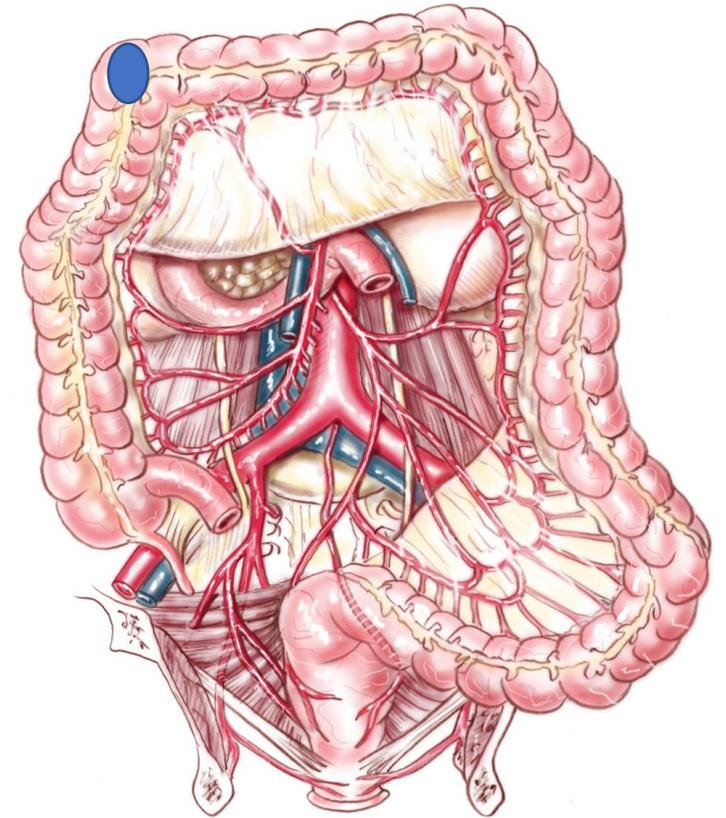
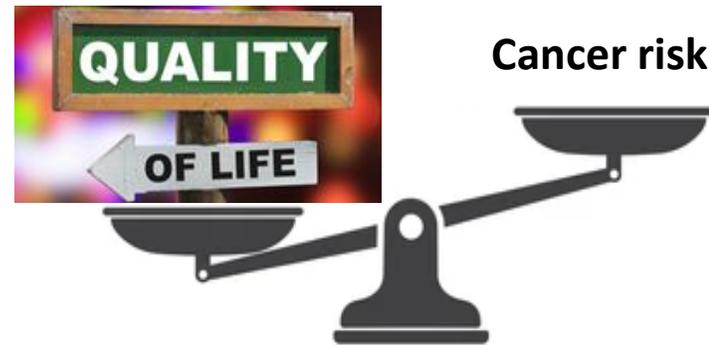
Hepatic flexure colon cancer

- Old patients (>65 y ?)
- MSH6 or PMS2



Hepatic flexure colon cancer

- Old patients (>65 y ?)
- MSH6 or PMS2

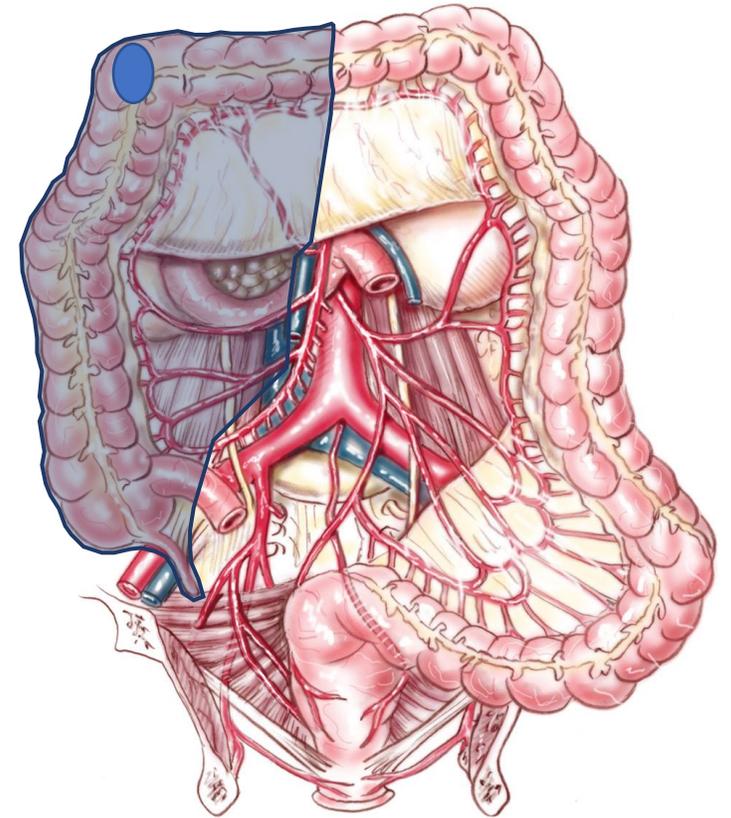
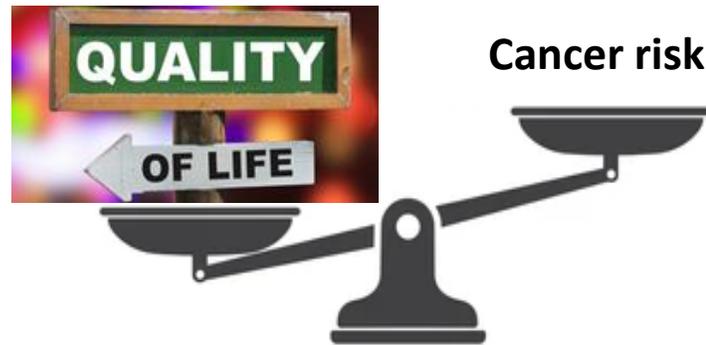


Hepatic flexure colon cancer

- Old patients (>65 y ?)
- MSH6 or PMS2

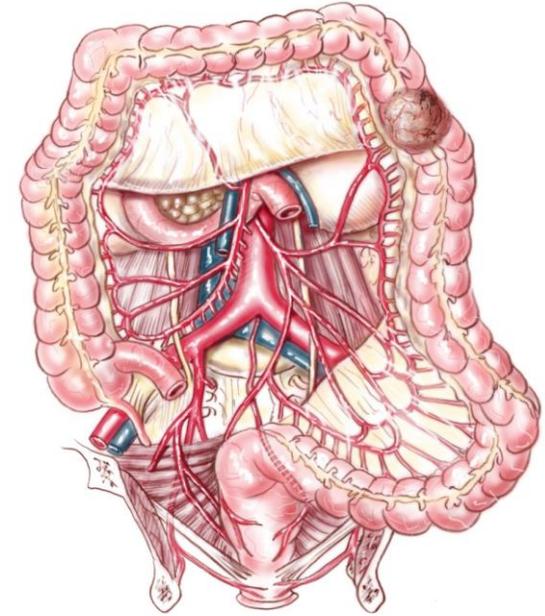
- **Segmental colectomy**
 - Right colectomy
 - + transverse colon

- **Complete lymphadenectomy**
 - Right vessels
 - Middle colic Art



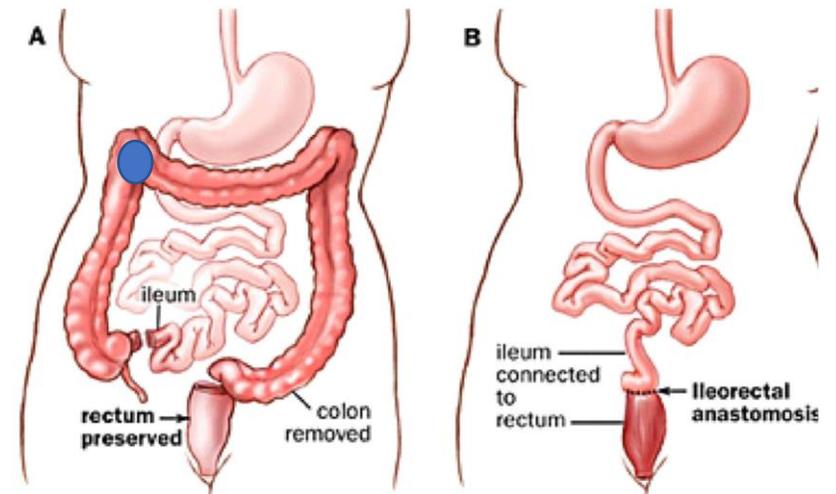
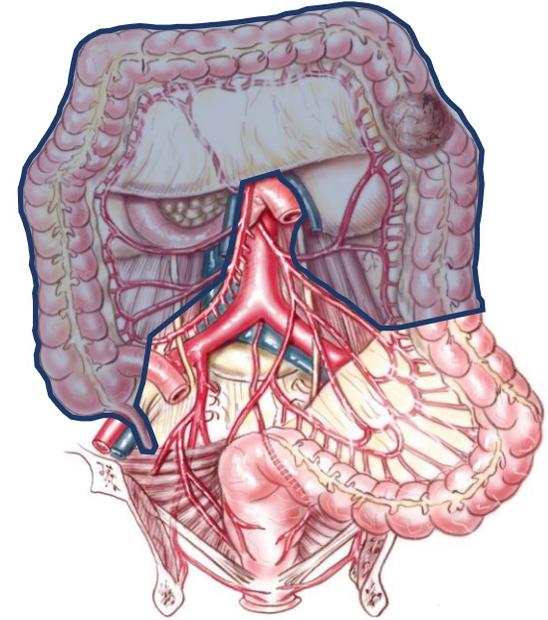
Splenic flexure colon cancer

- **Young patients**
- **MLH1 or MSH2**



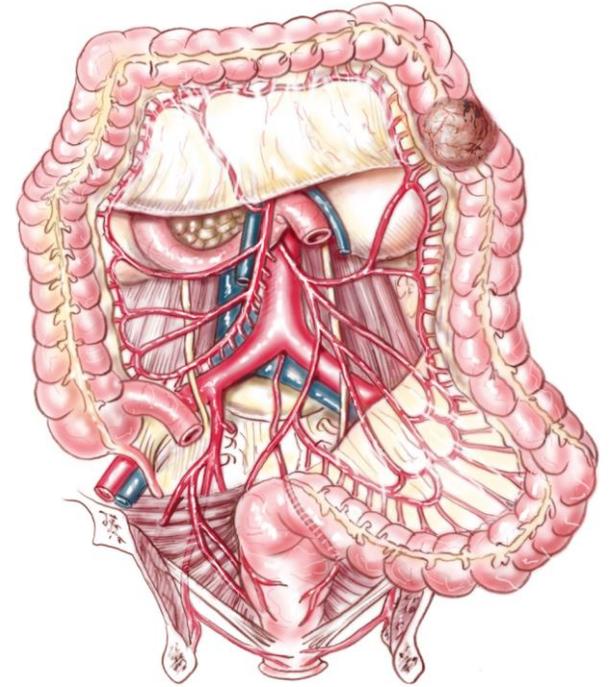
Splenic flexure colon cancer

- Young patients
- MLH1 or MSH2
- **Extended colectomy**
 - Subtotal colectomy
 - Or total colectomy
- **Complete lymphadenectomy**
 - Right vessels
 - Middle colic Art
 - Left superior colic Art
 - +/- AMI



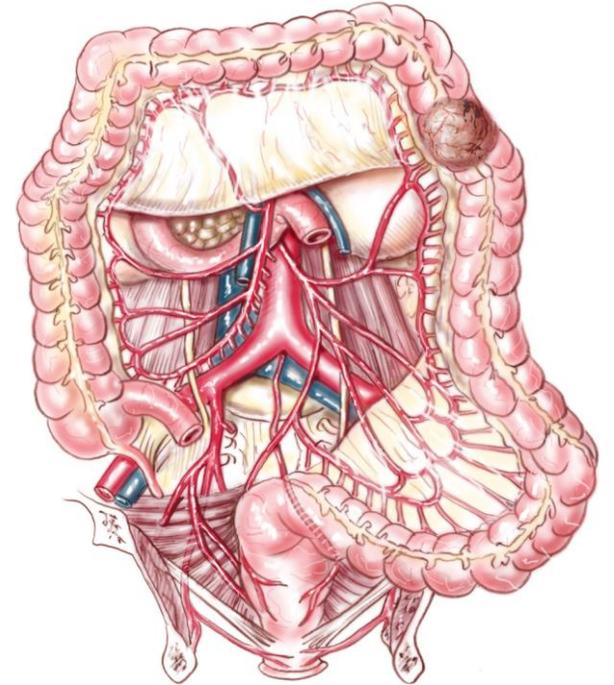
Splenic flexure colon cancer

- **Old patients (>65 y ?)**
- **MSH6 or PMS2**



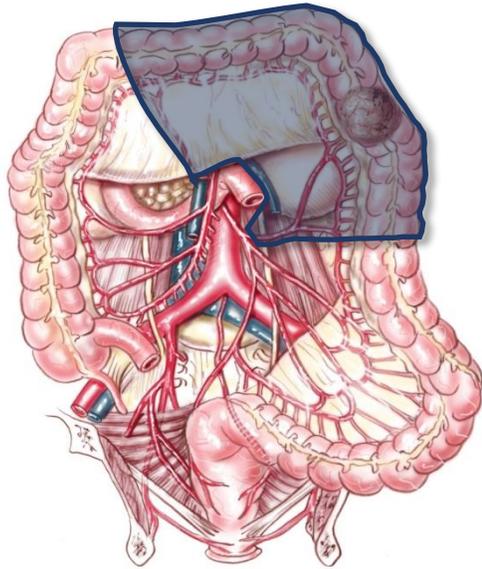
Splenic flexure colon cancer

- Old patients (>65 y ?)
- MSH6 or PMS2



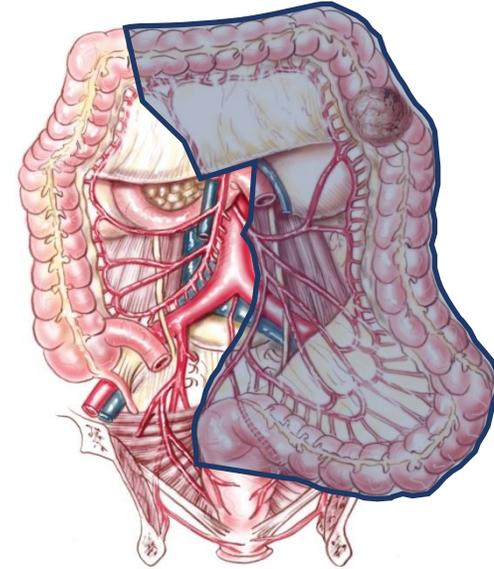
- **Segmental colectomy ?**

Splenic flexure colon cancer



Splenic flexure colectomy

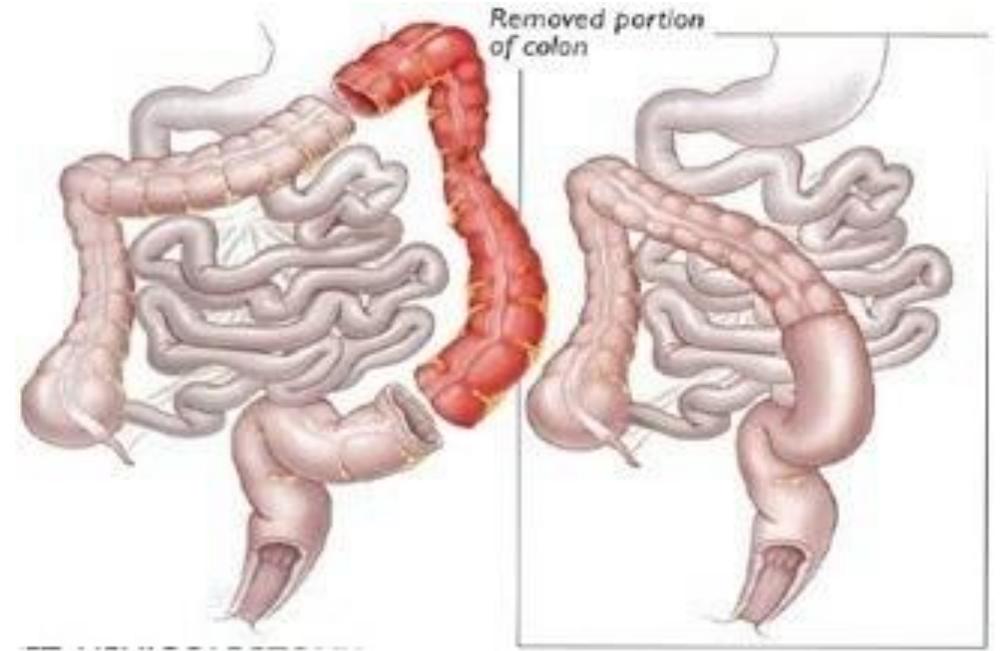
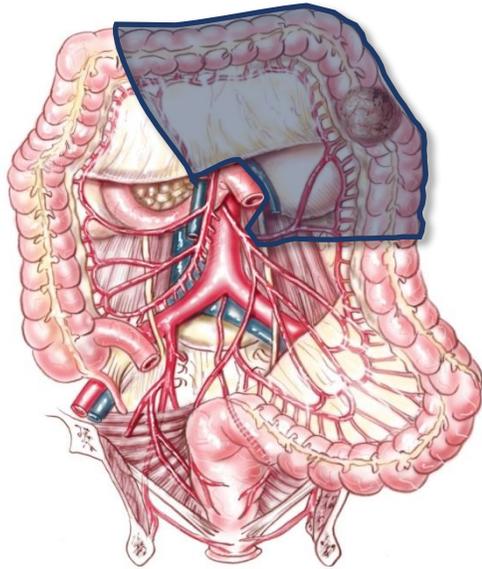
or



Left hemicolectomy

Segmental colectomies

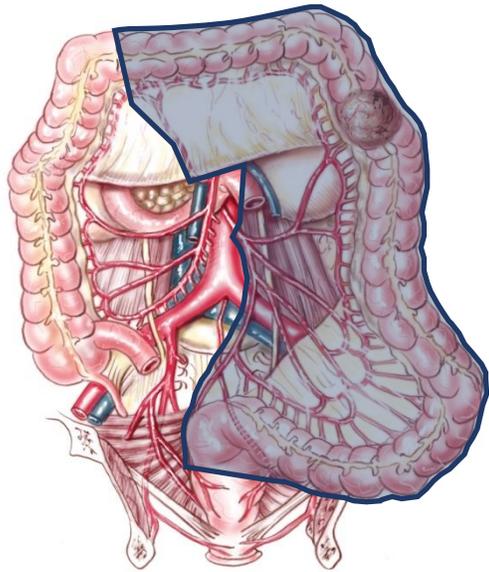
Splenic flexure colon cancer



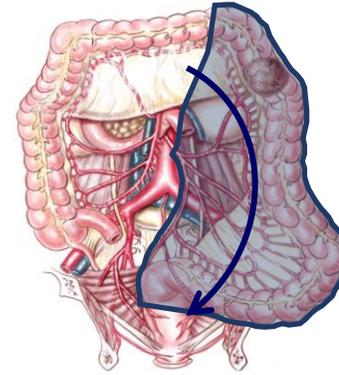
Splenic flexure colectomy

- Sometime difficult to do a **tension free anastomosis**
- Accused of
 - higher **anastomotic leakage**
 - **incorrect lymphadenectomy**

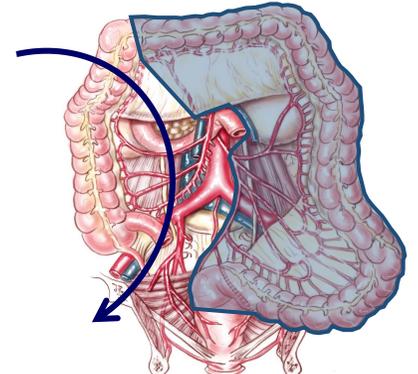
Splenic flexure colon cancer



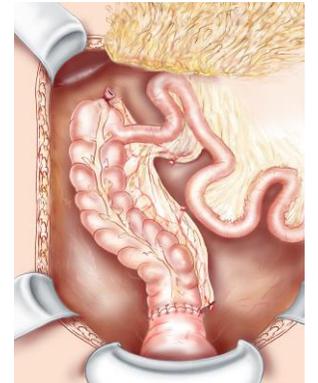
Left hemicolectomy



Transmesenteric Toupet's manoeuvre



Deloyers' technique



- Risk of colic ischemia
- Sometime difficult to do
- Especially by laparoscopy

Even for sporadic tumour at the splenic flexure

Segmental colectomy is controversial

What Is the Optimal Elective Colectomy for Splenic Flexure Cancer: End of the Debate? A Multicenter Study From the GRECCAR Group With a Propensity Score Analysis

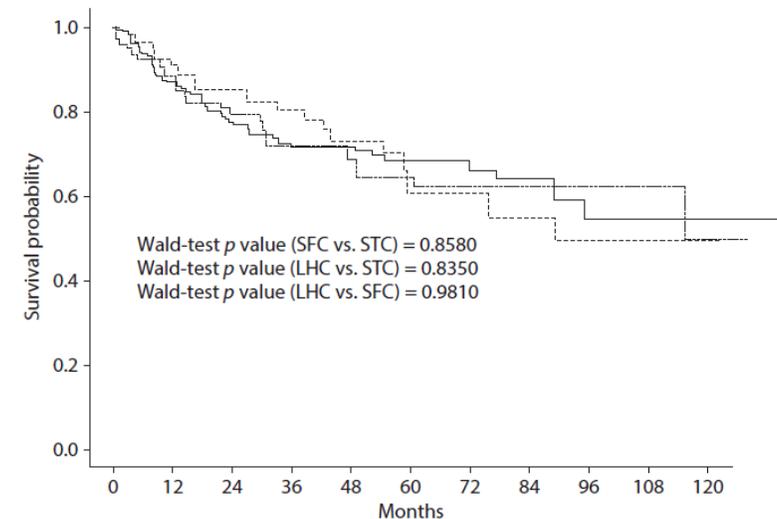
Gilles Manceau, M.D., Ph.D.¹ • Arnaud Alves, M.D., Ph.D.² • H el ene Meillat, M.D.³
 L eonor Benha im, M.D., Ph.D.⁴ • Mehdi Ouai ssi, M.D., Ph.D.⁵ • Yves H. Panis, M.D., Ph.D.⁶
 Jean-Jacques Tuech, M.D., Ph.D.⁷ • Bertrand Dousset, M.D., Ph.D.⁸
 C ecile Brigand, M.D., Ph.D.⁹ • Eddy Cotte, M.D., Ph.D.¹⁰ • Zaher Lakkis, M.D., Ph.D.¹¹
 Bogdan Badic, M.D., Ph.D.¹² • Fr ed eric Marchal, M.D.¹³ • Charles Sabbagh, M.D., Ph.D.¹⁴
 Momar Diouf, Ph.D.¹⁵ • Mehdi Karoui, M.D., Ph.D.¹



n=313

**splenic flexure colectomy
vs left hemicolectomy
vs subtotal colectomy**

- No difference for
 - pN stage
 - **Disease Free Survival**



SFC	275	206	168	141	106	81	51	33	18	9	6
LHC	224	184	171	149	110	64	50	23	21	14	7
STC	228	161	118	98	65	48	36	25	18	18	13

FIGURE 1. Survival analyses for disease-free survival after propensity score adjustment. LHC = left hemicolectomy; SFC = splenic flexure colectomy; STC = subtotal colectomy.

Current trends and controversies in the management of patients with splenic flexure tumours

Chan DS^{1*}, Shah PR², Soanes M³ and Saklani A⁴

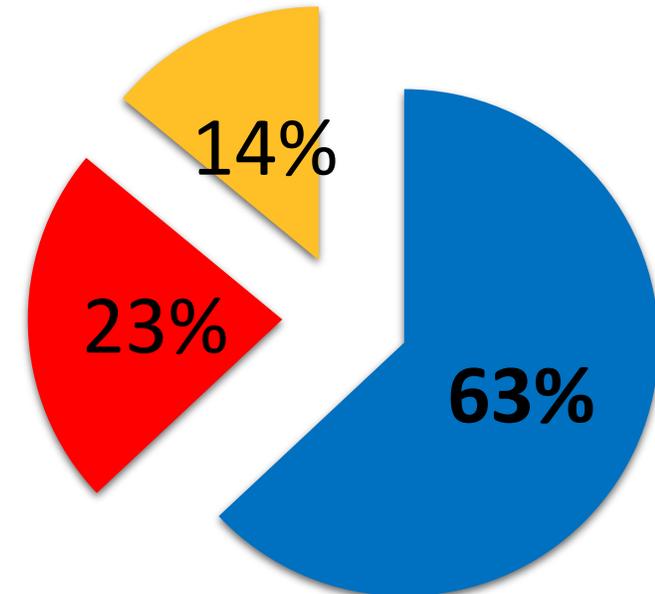
Chan DS et al., J Cancer Res Ther 2013, 1(1): 8-10

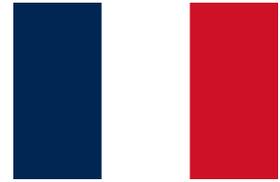


The Association of Coloproctology
of Great Britain and Ireland

- Survey. Anonymized questionnaires
- 111 surgeons
- “In an elective situation, what procedure would you perform for a tumor of the left splenic angle or the upper part of the descending colon? »

- Subtotal colectomy
- Left hemicolectomy
- Splenic flexure colectomy



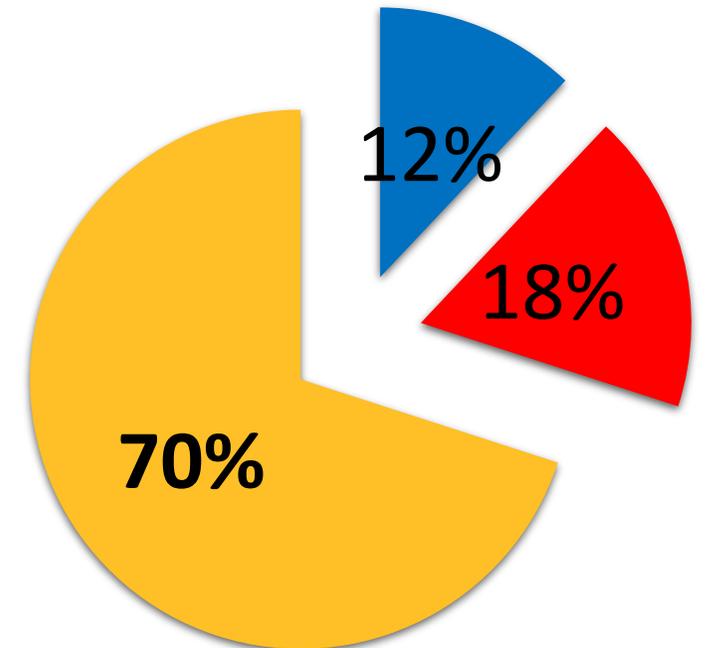


Elective surgery for tumours of the splenic flexure: a French inter-group (AFC, SFCD, FRENCH, GRECCAR) survey

G. Manceau¹ · S. Benoist² · Y. Panis³ · A. Rault⁴ · M. Mathonnet⁵ · D. Goere⁶ · J. J. Tuech⁷ · D. Collet⁸ · C. Penna² · M. Karoui¹

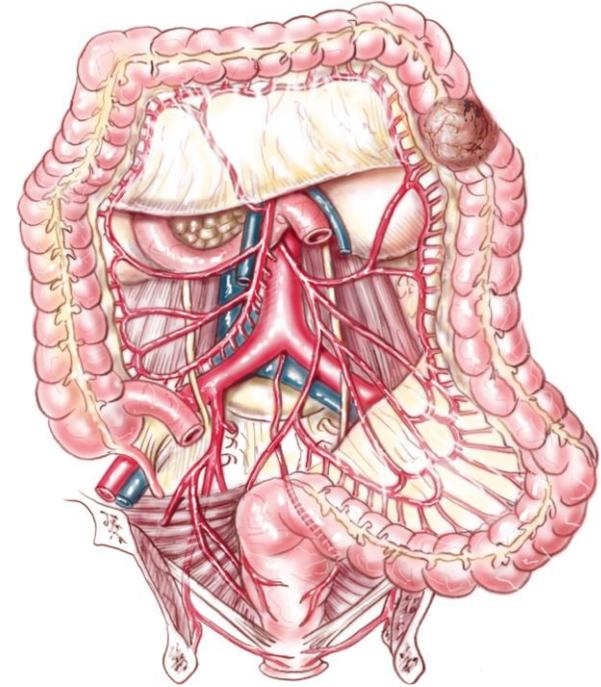
- 184 surgeons/128 centers

-  Subtotal colectomy
-  Left hemicolectomy
-  Splenic flexure colectomy



Splenic flexure colon cancer

- Old patients (>65 y ?)
- MSH6 or PMS2



Technical difficult aspects of segmental colectomies may be additional arguments to **prefer an extended colectomy**

But if you really want to **privilege the functional aspect** and quality of life, it's not a fault to **preform a segmental colectomy.**

CONCLUSIONS



CONCLUSIONS



Young patients
MLH1 or MSH2

Extended colectomy

Old patients
MSH6 or PMS2

Segmental colectomy



Young patients
MLH1 or MSH2

Extended colectomy

Old patients
MSH6 or PMS2

Extended or **segmental**
colectomy