

Table S1 Characteristics of 27 included studies

Study (First author, year)	Type of disease	Journal	Country	Inclusion period	Research center	Anti-TNF- α agents/Control	Pre-operative agents window	Anti-TNF- α	Concomitant medication
Appau KA et al. 2008	CD	Journal of Gastrointestinal Surgery	USA	1998-2007	Cleveland Clinic	60/329	Within 3 months		Steroids 5-ASA 6-MP/AZA MTX
Bregnbak D et al. 2012	UC	Journal of Crohn's and Colitis	Denmark	2005-2010	Hvidovre Hospital	20/51	Within 12 weeks		Corticosteroids Immunomodulators agents 5-ASA
Canedo J et al. 2011	CD	Colorectal Disease	USA	2000-2008	Cleveland Clinic Florida	65/85	Within 3 months		Steroids Immunosuppressive drugs
Ferrante M et al. 2009	UC	Inflammatory Bowel Diseases	Belgium	1998-2008	University Hospital Leuven	22/119	Within 12 weeks		Corticosteroids AZA 6-MP MTX CsA
Ferrante M et al. 2017	UC	Journal of Crohn's and Colitis	Belgium	2006-2016	University Hospitals of Leuven	60/71(Within 8 weeks) 66/80(Within 12 weeks)	Within 8 weeks/Within 12 weeks		Mesalamine Steroids Thiopurines Methotrexate Ciclosporin Antibiotics
Gainsbury ML et al. 2011	UC	Journal of Gastrointestinal Surgery	USA	2005-2009	Boston University Medical Center	29/52	Within 12 weeks		CsA(control) MTX AZA 6-MP Steroids
Gu JY et al. 2013	UC	Diseases of the Colon & Rectum	USA	2006-2010	Cleveland Clinic	25/156(proctocolectomy/I PAA) 142/265(Subtotal colectomy/end ileostomy)	Infliximab (within 12 weeks) Adalimumab(within 4 weeks) Certulizumab Pegol(within 4 weeks)		AZA/6-MP Steroid
Kotze PG et al.	CD	Digestive	Brazil	2007-2014	IBD referral units from	71/52	Within 8 weeks		Steroids

2017		Diseases and Sciences		Brazil				Immunomodulators
Kotze PG et al. 2017(AD)	CD	Colorectal Disease	Brazil	NA	IBD referral units in Brazil	25/25	Within 8 weeks	Steroids AZA/6-MP
Krane MK et al. 2013	IBD	Diseases of the Colon & Rectum	USA	2004-2011	University of Chicago Medical Center	142/376	Within 8 weeks	Steroids Immunomodulators 5-ASA
Kunitake H et al. 2008	IBD	journal of gastrointestinal surgery	USA	1993-2007	Massachusetts General Hospital	101/312	Within 12 weeks	Steroid AZA/6-MP
Lightner AL et al. 2017(CD)	CD	Alimentary Pharmacology & Therapeutics	USA	2014-2016	Mayo Clinic Rochester electronic medical record system	107/105	Within 12 weeks	Steroids Immunomodulators
Lightner AL et al. 2017(IBD)	IBD	Journal of Crohn's and Colitis	USA	2014-2015	Mayo Clinic Rochester	126/172	Within 12 weeks	Steroids Immunomodulators
Myrelid P et al. 2014	CD	British Journal of Surgery	UK	NA	Tertiary referral centres	111/187	Within 2 months/more than 2 months	Steroids AZA/6-MP MTX Mycophenolate mofetil
Nelson R et al. 2014	UC	Inflammatory Bowel Diseases	USA	2006-2012	University of Chicago Hospitals	24/31	2 weeks (range: 1–5)	Corticosteroids CsA
Nørgård BM et al. 2014	CD	Alimentary Pharmacology & Therapeutics	Denmark	2000-2010	The Danish National Patient Registry	Within 14 days:43 Within 12 weeks: 214 Control: 2079	Within 14 day Within 15-30 days Within 12 weeks	Steroids AZA/6-MP
Nørgård BM et al. 2012	UC	Alimentary Pharmacology and Therapeutics	Denmark	2003-2010	Denmark (The whole country)	199/1027	Within 12 weeks	Steroids AZA/6-MP MTX or CsA
Rizzo G et al. 2011	IBD	International journal of colorectal disease	Italy	2001-2008	Complesso Integrato Columbus Hospital	54/60	Within 12 weeks	Steroids Immunomodulators
Shwaartz C et	IBD	Journal of	USA	2013-2015	Mount Sinai Medical	73/209	Within 8 weeks	Steroids

al. 2016		gastrointestinal surgery			Center			Immunomodulators ASA
Syed A et al. 2013	CD	American Journal of Gastroenterology	USA	2004-2011	University of Maryland School of Medicine	150/175	Within 8 weeks	Corticosteroids 6-MP/AZA MTX
Uchino M et al. 2013(UC)	UC	International Journal of Colorectal Disease	Japan	2010-2012	Hyogo College of Medicine	22/174	Within 12 weeks	Prednisolone Immunomodulators
Uchino M et al. 2013(CD)	CD	Diseases of the Colon & Rectum	Japan	2008-2011	Surgical Department of Hyogo College of Medicine	79/326	Within 12 weeks	Corticosteroids 5-aminosalicylic acid Immunomodulators
Ward ST et al. 2017	UC	Colorectal Disease	UK	2006-2015	Hospital Episode Statistics data maintained National Health Service	Within 12 weeks:753/5472 Within 4 weeks:418/5807	Within 4 week/Within 12 weeks	NA
Waterman M et al. 2013	IBD	Gut	Canada	2000-2010	Mount Sinai Hospital	Within 12 days:56 15-30 days:48 31-180 days:89 Controls:278	Within 12 days Within 15-30 days Within 31-180 days	Corticosteroids AZA/6-MP
Yamada A et al. 2017	IBD	American Journal of Gastroenterology	USA	2014-2016	IBD database of institutional review board	UC:33/129CD:96/121	Within 4 weeks prior to surgery	Steroids Immunomodulators
Yamamoto T et al. 2016	CD	United European Gastroenterology Journal	Japan Brazil Italy	2008-2013	International multicentre	79/152	Within 8 weeks	Steroids AZA/6-MP
Zittan E et al. 2016	UC	Inflammatory Bowel Diseases	Canada	2002-2013	Mount Sinai Hospital	Within 12 days:10 15-30 days:17 31-180 days:54 Controls:562	Within 12 days Within 15-30 days Within 31-180 days	Corticosteroids AZA/6-MP

Table S1 Continued

Study (First author,year)	Type of anti-TNF-α agents	Type of surgery	Age of surgery(years)		Sex (Male/Female)	
			Anti-TNF-α agents	Control	Anti-TNF-α agents	Control
Appau KA et al. 2008	Infliximab	Ileocolonic Resection	35.83±11.90	36.84±14.37	29/31	151/178
Bregnbak D et al. 2012	Infliximab	Colectomy	Median: 39.8 (range: 29.1–49.5)	Median: 40.6 (range: 28.7–51.4)	9/11	29/22
Canedo J et al. 2011	Infliximab	Ileocolic resection Total colectomy Proctectomy	Median: 26 (range: 16–72)	Median: 32 (range: 18–78)	29/36	46/39
Ferrante M et al. 2009	Infliximab	IPAA	Median: 26.1 (range: 16.2–43.0)	Median: 32.1 (range: 25.2–41.6)	9/13	49/70
Ferrante M et al. 2017	Infliximab(40) Adalimumab(19) Golimumab Pegol(6)	IPAA	35.5 (26.6 – 47.6)(Within 8 weeks)	45.8 (35.2 – 56.1)(Within 8 weeks)	30/30(Within 8 weeks)	30/41(Within 8 weeks)
Gainsbury ML et al. 2011	Infliximab	IPAA	36.2 ± 12.6	42.0 ± 12.7	11/18	22/30
Gu JY et al. 2013	Infliximab(113) Adalimumab(26) Certulizumab Pegol(3)	Total proctocolectomy/IPAA Subtotal colectomy/end ileostomy	39 (19–61) (proctocolectomy/IPAA) 37 (18–77) (Subtotal colectomy/end ileostomy)	39 (18–69)(proctocolectomy/IPAA) 41 (18–84)(Subtotal colectomy/end ileostomy)	13/12(proctocolectomy /IPAA)74/68(Subtotal colectomy/end ileostomy)	92/64(proctocolectomy /IPAA)152/113(Subtotal colectomy/end ileostomy)
Kotze PG et al. 2017	Infliximab(39)Adalimumab(32)	Small bowel resection Ileocecal resection Total colectomy	35.4±12.3	38.5±14.1	39/32	28/24
Kotze PG et al. 2017(AD)	Adalimumab	Intestinal resections	Median:36.6	Median:36.8	14/11	14/11
Krane MK et al. 2013	Infliximab	Hand-assisted aparoscopic surgery Small-bowel resection Ileocolic resection Right hemicolectomy Sigmoidectomy Total proctocolectomy	36.7 ± 13.9	39.2 ± 14.4	76/66	198/178

		Ileorectal anastomosis				
		IPAA				
Kunitake H et al. 2008	Infliximab	Small bowel resection/J20strictureplasty	Median:36.1	Median:37.8	41/60	162/150
		R colect/ileoocectomy				
		Partial colectomy (transverse, left)				
		Subtotal colectomy				
		Total proctocolectomy				
		Proctectomy				
		IPAA				
Lightner AL et al. 2017(CD)	Infliximab	Colorectal resection Small bowel resection	Median: 39 (range: 19–69)	Median: 35 (range: 18–70)	39/68	54/51
	Adalimumab					
	Certolizumab	Colorrectal and small bowel resection				
	Pegol					
Lightner AL et al. 2017(IBD)	Any TNF-α agents	Small bowel resection	41 (24–70)	46 (24–70)	67/59	97/93
		Ileocolonic resection				
		Colectomy				
		Proctectomy				
		Total proctocolectomy				
		Ostomy only				
		Primary anastomosis				
Myrelid P et al. 2014	Infliximab(40/117) Adalimumab(71/70)	Small bowel resection	Median: 35.6 (range: 12–82)	Median: 36.6 (range: 12–76)	51/ 60	68/119
		Ileocolic resection				
		Colonic resection				
		Stoma closure				
		Strictureplasty alone				
		Including strictureplasty				
		Including severe adhesiolysis				
Nelson R et al. 2014	Infliximab	IPAA	Median: 41 (range: 18–85)	Median: 52 (range: 18–79)	11/13	17/14
Nørgård BM et al. 2014	Infliximab	Small bowel resections	Median: 33 (range: 16–86)	Median: 41 (range: 15–90)	97/117	852/1227
	Adalimumab	Ileocecal resection				
	Certolizumab	Right hemicolectomy				
	Pegol	Other resections of small bowel and colon				

		Other colon resections Other bowel resections Colectomies Resections on rectum Intestinal plastic for small bowel stricture				
Nørgård BM et al. 2012	Infliximab(167) Adalimumab(15) Unspecified anti-TNF-α agents(17)	Colectomy	Median: 37 (range: 15–82)	Median: 42 (range: 15–95)	95/104	527/500
Rizzo G et al. 2011	Infliximab(41) Adalimumab(12) Certulizumab Pegol(1)	Ileal pouchanal anastomosis	39 (16–74)	39 (18–71)	35/19	36/24
Shwaartz1 C et al. 2016	InfliximabAdalimu mabCertolizumab Pegol	Ileoanal pouch leocolic resection Partial colectomy Ileostomy reversal Small bowel resection Ileosigmoid/ileorectal Anastomosis	36.6 ± 14.5	42.6 ± 15.8	42/31	102/107
Syed A et al. 2013	Infliximab(104) Adalimumab(29) Certolizumab(17)	Creation of a stoma anastomoses Segmental colectomy Right hemicolectomy Left hemicolectomy Total abdominal colectomy/proctectomy Ileocectomy Small bowel resection Ostomy creation as 1 ° procedure Hernia/stoma revision	38.2 ± 13.9	40.0 ± 14.3	51/99	79/96
Uchino M et al. 2013(UC)	Infliximab	Total colectomy Mucosal proctectomy IPAA	Median: 41 (range: 14–61)	Median: 43 (range: 10–85)	15/7	114/60
Uchino M et al. 2013(CD)	Infliximab	NA	Median: 36 (range: 14–72)	Median: 37 (range: 16–78)	58/21	226/100

Ward ST et al. 2017	Infliximab	Subtotal colectomy	within 12 weeks/within 4 weeks	within 12 weeks/within 4 weeks	Within 4 weeks243/175	Within 4 weeks3371/2436
	Adalimumab				Within 12 weeks:411/312	Within 12 weeks:3173/2299
	Golimumab		<18: 66/36	<18: 218/248		
			18-30: 253/134	18-30: 1247/1366		
			31-50: 255/145	31-50: 1887/1997		
			51-70: 155/89	51-70: 1534/1600		
			>70: 24/14	>70: 586/596		
Waterman M et al. 2013	Infliximab	Small bowel resection	Median:21	Median:23	138/57	223/55
	Adalimumab	Subtotal colectomy and ileostomy				
		Ileostomy/colostomy				
		Closure of ileostomy/colostomy				
		Pelvic pouch procedure				
		Completion proctectomy				
		Total proctocolectomy and ileostomy				
Yamada A et al. 2017	Infliximab	Small bowel resection	39.4±13.6	39.8±15.4	61/68	126/124
	Adalimumab	Colonic resection				
		Ileocectomy				
		Ileocolectomy				
		Strictureplasty				
		Proctectomy				
		Total colectomy				
		J-pouch creation or resection				
		Examination under anesthesia				
		Ostomy creation				
		Ileostomy takedown				
		Hernia repair				
Yamamoto T et al. 2016	Infliximab(55)	Ileocolonic resection	<17 years: 14	<17 years: 13	47/32	97/55
	Adalimumab(23)	Small bowel strictureplasty	17–40 years: 56	17–40 years: 105		
	Infliximab and adalimumab(1)	Small bowel resection	>40 years: 9	>40 years: 34		
		Colonic resection				
Zittan E et al. 2016	Any TNF-α agents	IPAA	31 (IQR:24, 42)	39 (IQR:29, 47)	115/81	322/240

Table S1 Continued

Study (First	Timing of surgery	Details of complications (number)
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author, year)	Anti-TNF- α agents	Control	Anti-TNF- α agents	Control
Appau KA et al. 2008	NA	NA	Urinary complications (1)	
			Wound dehiscence (0)	Urinary complications (0)
			30-Day mortality (1)	Wound dehiscence (1)
			Readmission rate (12)	30-Day mortality (0)
			Sepsis (12)	Readmission rate (31)
			Intraabdominal abscess (6)	Sepsis (32)
			Anastomotic leak (6)	Intraabdominal abscess (14)
			Reoperation (5)	Anastomotic leak (14)
Bregnbak D et al. 2012	NA	NA		Reoperation (10)
			Fever (4)	Fever (9)
			Wound infection (1)	Wound infection (7)
			Abscess (1)	Abscess (2)
			Pneumonia (1)	Pneumonia (1)
			Gastroenteritis (0)	Gastroenteritis (2)
			Candida infection (0)	Candida infection (1)
			Epididymitis (1)	Epididymitis (0)
			Urinary tract infection (0)	Urinary tract infection (1)
			Sepsis (0)	Sepsis (1)
			Infection of undetermined cause (0)	Infection of undetermined cause (1)
			Ileus (6)	Ileus (7)
			Wound rupture (1)	Wound rupture (13)
			Drug-induced eczema (0)	Drug-induced eczema (2)
			Postspinal headache (0)	Postspinal headache (2)
			Deep vein thrombosis (0)	Deep vein thrombosis (1)
			Delirium (0)	Delirium (1)
			Emphysema (0)	Emphysema (1)
			Total(10)	Total(25)
			Infectious(4)	Infectious(21)
			Non-infectious(6)	Non-infectious(9)
Canedo J et al. 2011	Urgent:5 Elective:60	Urgent:15 Elective:70	Wound infection (9)	Wound infection (6)
			Pulmonary infection (1)	Pulmonary infection (3)
			Abscesses (2)	Abscesses (6)
			Anastomotic leakage (2)	Anastomotic leakage (4)
Ferrante M et al.	NA	NA	Reoperations (2)	Reoperations (7)
			Anastomotic leak(0)	Anastomotic leak(15)

2009			Pelvic abscess(0) Pouch-related complications(0) Wound infection(1) Surgical site infectious complications(1) Nonsurgical site infectious complications(1) Any infectious complications(2)	Pelvic abscess(9) Pouch-related complications(18) Wound infection(10) Surgical site infectious complications(23) Nonsurgical site infectious complications(10) Any infectious complications(29)
Ferrante M et al. 2017	NA	NA	Within 8 weeks/12weeks Anastomotic leak(1/1) Pouch-related infectious complications(2/2) Surgical site infectious complications(8/10) Other infectious(10/12) Infectious complications overall(16/19) Non-infectious complications overall(22/25) Any complications(29/33)	Within 8 weeks:Anastomotic leak(6) Pouch-related infectious complications(7) Surgical site infectious complications(11) Other infectious(17) Infectious complications overall(23) Non-infectious complications overall(31) Any complications(40) Within 12 weeks:Anastomotic leak(6) Pouch-related infectious complications(7) Surgical site infectious complications(13) Other infectious(16) Infectious complications overall(24) Non-infectious complications overall(33) Any complications(43)
Gainsbury ML et al. 2011	Urgent:3 Elective:26	Urgent:5 Elective:47	Overall(13) Infectious(5) Pelvic/intraabdominal abscess(4) Wound infection(1) Non-infectious(12) Pouch/anastomotic leak(1) Pouch-related(0) Other(12)	Overall(23) Infectious(14) Pelvic/intraabdominal abscess(7) Wound infection(10) Non-infectious(16) Pouch/anastomotic leak(5) Pouch-related(2) Other(13)
Gu JY et al. 2013	Urgent:42 Elective:100 (Subtotal colectomy/end ileostomy)	Urgent:96 Elective:159 (Subtotal colectomy/end ileostomy)	proctocolectomy/IPAA: Postoperative morbidity (11) Anastomotic leak(2) Pelvic sepsis (4) Wound infection(2) Early postoperative smallbowel obstruction(1) Postoperative hemorrhage(0)	proctocolectomy/IPAA: Postoperative morbidity (84) Anastomotic leak(12) Pelvic sepsis (11) Wound infection(10) Early postoperative smallbowel obstruction(6) Postoperative hemorrhage(5)

			Subtotal colectomy/end ileostomy: Postoperative mortality(2) Postoperative morbidity(67) Pelvic abscess(3) (Colo)rectal stump leak(16) Wound infection(21) Urinary tract infection(2)Pneumonia(2) Ileus(17) Postoperative hemorrhage(3) Stoma complications(3) Thromboembolic complications(7)	Subtotal colectomy/end ileostomy: Postoperative mortality(1) Postoperative morbidity(135) Pelvic abscess(12) (Colo)rectal stump leak(24) Wound infection(28) Urinary tract infection(8)Pneumonia(2) Ileus(34) Postoperative hemorrhage(9) Stoma complications(7) Thromboembolic complications(22)
Kotze PG et al. 2017	Elective	Elective	Over all surgical complication (28) Abdominal abscesses (10) Anastomotic dehiscence (6) Bowel obstruction (3) Surgical site infection (26) Reoperation (12) Overall medical complication (15) Pneumonia (7) Urinary tract infections (1) Other complications (12) Readmissions (8) Death (2)	Over all surgical complication (17) Abdominal abscesses (2) Anastomotic dehiscence (6) Bowel obstruction (5) Surgical site infection (11) Reoperation (7) Overall medical complication (11) Pneumonia (3) Urinary tract infections (2) Other complications (8) Readmissions (1) Death (2)
Kotze PG et al. 2017(AD)	Elective	Elective	Surgical complications Overall Surgical complications (9) Abdominal abscess (3) Bowel Obstruction (0) Anastomotic Dehiscence (2) Surgical Site Infection (9) Reoperation (4) Overall Medical complications (3) Pneumonia (0) Urinary tract infection (0) Other complications (5) Readmissions (2)	Surgical complications Overall Surgical complications (10) Abdominal abscess (2) Bowel Obstruction (3) Anastomotic Dehiscence (4) Surgical Site Infection (6) Reoperation (4) Overall Medical complications (9) Pneumonia (2) Urinary tract infection (1) Other complications (6) Readmissions (1)

			Death (0)	Death (1)
Krane MK et al. 2013	Elective	Elective	30-day morbidity(36)	30-day morbidity(92)
			Infectious(17)	Infectious(42)
			Wound infection(8)	Wound infection(17)
			Intra-abdominal abscess(8)	Intra-abdominal abscess(20)
			Urinary infection(0)	Urinary infection(1)
			Clostridium difficile infection(1)	Clostridium difficile infection(3)
			Pneumonia(0)	Pneumonia(1)
			Anastomotic leakage(3)	Anastomotic leakage(5)
			Thrombotic(5)	Thrombotic(21)
			Others(11)	Others(24)
			Prolonged ileus(8)	Prolonged ileus(9)
			SBO(3)	SBO(9)
			Dehydration(0)	Dehydration(3)
			Acute pancreatitis(0)	Acute pancreatitis(1)
			Acute myocardial infarction(0)	Acute myocardial infarction(1)
			Transient ischemic attack(0)	Transient ischemic attack(1)
Kunitake H et al. 2008	NA	NA	Leak(3)	Leak(9)
			Bleeding(1)	Bleeding(2)
			Death(2)	Death(1)
			Infectious(6)	Infectious(31)
			Thrombotic(3)	Thrombotic(2)
			Cardiac(0)	Cardiac(2)
			Hepatorenal(1)	Hepatorenal(2)
Lightner AL et al. 2017(CD)	NA	NA	Death (0)	Death (0)
			Non-SSI infections (5)	Non-SSI infections (2)
			urinary tract infection (3)	urinary tract infection (2)
			Pneumonia (2)	Pneumonia (0)
			Line Sepsis (0)	Line Sepsis (0)
			All SSI (9)	All SSI (12)
			Superficial SSI (8)	Superficial SSI (4)
			Deep SSI (2)	Deep SSI (6)
			Anast leak (0)	Anast leak (3)
			Mucocutaneous separation (0)	Mucocutaneous separation (0)
			SBO/ileus (9)	SBO/ileus (9)
			Readmission (7)	Readmission (12)

			Return to operating room (4)	Return to operating room (9)
Lightner AL et al. 2017(IBD)	NA	NA	Any postoperative complication(35) Non-SSI infections(6) urinary tract infection(2) Pneumonia(1) Non-abdominal sepsis(2) C.diff colitis(1) Cholangitis(0) All SSIs(13) sSSIs(5) dSSIs(6) Anastomotic leak (4) Mucocutaneous separation(1) small bowel obstruction(12) Readmission(12) Return to the operating room(10)	Any postoperative complication(57) Non-SSI infections(10) urinary tract infection(5) Pneumonia(2) Non-abdominal sepsis(2) C.diff colitis(0) Cholangitis(1) All SSIs(22) sSSIs(11) dSSIs(11) Anastomotic leak (1) Mucocutaneous separation(1) small bowel obstruction(20) Readmission(17) Return to the operating room(8)
Myrelid P et al. 2014	Elective: 98Urgent: 11Emergency: 2	Elective: 157Urgent: 21Emergency: 9	Any complication (38) Anastomotic complications (8) Infectious complications (excluding anastomotic complications)(18) Other (12) Need for Repeat surgery (9) Need for radiology-guided drainage (4)	Any complication (54) Anastomotic complications (15) Infectious complications (excluding anastomotic complications) (26) Other (13) Need for Repeat surgery (13) Need for radiology-guided drainage (7)
Nelson R et al. 2014	Acute	Acute	Infectious(6) Pelvic abscess(2) Wound(2) Non-specific(2) Non-infectious(5) Thrombosis(2) Hospitalizations(3) Wound failure(0) Total(9)	Infectious(9) Pelvic abscess(2) Wound(3) Non-specific(4) Non-infectious(13) Thrombosis(3) Hospitalizations(7) Wound failure(4) Total(18)
Nørgård BM et al. 2014	NA	NA	Death (1) Reoperation (16) Anastomosis leakage (8) Percutaneous abscess drainage (0)	Death (54) Reoperation (175) Anastomosis leakage (56) Percutaneous abscess drainage (3)

			Within 14 days:Death (0) Reoperation (1) Anastomosis leakage (1) 15-30 days:55Death (0) Reoperation (6) Anastomosis leakage (2) 31-84 days:116Death (1) Reoperation (9) Anastomosis leakage (5)	
Nørgård BM et al. 2012	Acute or elective	Acute or elective	Death(0) Reoperation(43) Anastomosis leakage(1) Percutaneous abscess drainage(0)	Death(30) Reoperation(230) Anastomosis leakage(16) Percutaneous abscess drainage(2)
Rizzo G et al. 2011	Elective:49 Urgent:5	Elective:54 Urgent:6	Cumulative complications(14) Infective complications(9) Hypomotility(2) Thrombotic complications(1) Hepatorenal failure(2) Bleeding requiring re-surgery(3) Anastomotic leak(4) Hospital readmission(6)	Cumulative complications(10) Infective complications(8) Hypomotility(0) Thrombotic complications(0) Hepatorenal failure(1) Bleeding requiring re-surgery(1) Anastomotic leak(3) Hospital readmission(3)
Shwaartz1 C et al. 2016	NA	NA	Anastomotic leak(4)Intra-abdominal abscess(4)Wound infection(5)Extra-abdominal infection(3)Readmission(6)	Anastomotic leak(11)Intra-abdominal abscess(4)Wound infection(9)Extra-abdominal infection(4)Readmission(11)
Syed A et al. 2013	Urgent: 15 Elective: 135	Urgent: 24 Elective: 151	Myocardial infarction (1) Readmission (28) Postoperative bleeding (7) Intra-abdominal abscess (21) Peritonitis (6) Anastomotic leak (9) Wound dehiscence (5) Local fistula (2) Wound infection (28) Sepsis (11) Pneumonia (4) Major infection (26)	Myocardial infarction (3) Readmission (23) Postoperative bleeding (12) Intra-abdominal abscess (18) Peritonitis (8) Anastomotic leak (9) Wound dehiscence (6) Local fistula (4) Wound infection (20) Sepsis (17) Pneumonia (8) Major infection (31)

			Reoperation (24) Deep venous thrombosis (10) Pulmonary embolism (3) Mortality (2) Intra-abdominal septic complication (28) Surgical site complication (48) Infectious complication (54) Major complication (47)	Reoperation (23) Deep venous thrombosis (4) Pulmonary embolism (2) Mortality (1) Intra-abdominal septic complication (27) Surgical site complication (39) Infectious complication (44) Major complication (47)
Uchino M et al. 2013(UC)	Urgent: 4 Elective: 18	Urgent: 49 Elective: 125	Overall surgical site infection (1) Incisional surgical site infection (1) Organ/space surgical site infection (0) Other infectious complications(0)	Overall surgical site infection (46) Incisional surgical site infection (31) Organ/space surgical site infection (15) Other infectious complications(21)
Uchino M et al. 2013(CD)	NA	NA	SSI(9)Incisional(4)Organ/space(5)	SSI (99)Incisional(70)Organ/space (29)
Ward ST et al. 2017	Within 12 weeks/Within 4 weeks Urgent: 442/304 Elective: 311/114	Within 12 weeks/Within 4 weeks Urgent: 3178/3316 Elective: 2294/2491	within 12 weeks/within 4 weeks Any complication(94/54) Gastrointestinal(55/31) Wounds(16/10) Infections(35/19) Renal/endocrine(0/0) Cardiovascular(0/0) Pulmonary(0/0) Neurological(0/0)	within 12 weeks/within 4 weeks Any complication: (656/696) Gastrointestinal: (349/373) Wounds: (122/128) Infections: (270/286) Renal/endocrine: (115/118) Cardiovascular: (95/100) Pulmonary: (50/52) Neurological: (8/8)
Waterman M et al. 2013	Urgent/Elective	Urgent/Elective	Within 14 days/15-30 days/31-180 days Re-hospitalisation(16/9/15) Fever after surgery(9/5/14) Urinary tract infection(3/3/5) Pneumonia(1/2/2) Other serious infection(1/2/2) Wound infection(13/6/18) Bacteraemia(3/0/4) Postoperative ileus/small bowel obstruction(13/11/16) Anastomotic leak(2/0/3) Postoperative antibiotics(11/8/16) Reoperation(2/1/5)	Re-hospitalisation(41) Fever after surgery(42) Urinary tract infection(11) Pneumonia(9) Other serious infection(5) Wound infection(29) Bacteraemia(5) Postoperative ileus/small bowel obstruction(67) Anastomotic leak(15) Postoperative antibiotics(38) Reoperation(12) Septic shock(4)

			Septic shock(1/0/2)	Percutaneous abscess drainage(14)
			Percutaneous abscess drainage(4/1/2)	Death at 30 days(1)
			Death at 30 days(0/1/1)	Poor healing (due to leak, reoperation, abscess drainage, wound infection)(35)
			Poor healing (due to leak, reoperation, abscess drainage, wound infection)(13/7/19)	
Yamada A et al. 2017	Urgent:23Elective:106	Urgent:35Elective:215	UC/CDInfectious: (9/10) Abdominal abscess (2/6) SSIs (4/1) Leakage (2/2) Respiratory infection (0/1) Urinary infection (1/0) Non-infectious: 6/15Ileus (1/4) Bleeding (1/2) PE/DVT (0/1) Anemia (0/0) Skin lesion (1/1) Wound dehiscence (1/1) Urinary retention (0/1) Abdominal pain:(2/0) AKI (0/1) Tachycardia (0/0)	UC/CDInfectious: 18/16Abdominal abscess (10/8) SSIs (2/3) Leakage (2/2) Respiratory infection (2/3) Urinary infection (2/0) Non-infectious: 30/25Ileus (6/5) Bleeding (2/5) PE/DVT (0/1) Anemia (1/0) Skin lesion (3/2) Wound dehiscence (6/1) Urinary retention (2/1) Abdominal pain:(4/2) AKI (0/0) Tachycardia (0/0)
Yamamoto T et al. 2016	NA	NA	Overall complications (17) Intra-abdominal sepsis (9) Anastomotic leak (7)	Overall complications (38) Intra-abdominal sepsis (18) Anastomotic leak (12)
Zittan E et al. 2016	NA	NA	Within 14 days/15-30 days/31-180 days DVT(0/1/3) SBO(0/3/12) wound infection(2/1/8) Pelvic abscess (1/2/11) Pouch anastomosis leak (1/1/8)	DVT (23) ileus/SBO (92) wound infection (79) Pelvic abscess (96) Pouch anastomosis leak (66)

UC: Ulcerative colitis; CD: Crohn Disease; NA: not available; IBD: Inflammatory bowel disease; 5-ASA: 5-Aminosalicylic acid; 6-MP: 6-Mercaptopurine; AZA: azathioprine; MTX: methotrexate; CsA: Ciclosporin A; IPAA: ileal pouch-anal anastomosis; SSI: Surgical site infectious; sSSI: superficial surgical site infection; dSSI: deep space surgical site infection; DVT: deep venous thrombosis; SBO: small-bowel obstruction; AMI: acute myocardial infarction; TIA: transient ischemic attack; PE: pulmonary embolism; AKI: acute kidney injury; *C.diff: Clostridium difficile*.

Table S2: Sensitivity analysis for three forest plot

Wound infection (within 4 weeks)				
Excluded study	OR	95%CI	I²	P values
Yamada A et al. 2017	1.09	[0.59, 2.03]	65%	0.78
Nelson R et al. 2014	1.06	[0.54, 2.10]	67%	0.86
Ward ST et al. 2017	1.02	[0.45, 2.32]	64%	0.96
Yamada A et al. 2017	0.88	[0.46, 1.66]	58%	0.69
Zittan E et al. 2016	1.29	[0.79, 2.12]	41%	0.31
Waterman M et al. 2013	0.86	[0.44, 1.66]	51%	0.65
Surgical site infectious complications(within 4 weeks)				
Excluded study	OR	95%CI	I²	P values
Kotze PG et al. 2017	1.14	[0.41, 3.15]	65%	0.80
Kotze PG et al. 2017(AD)	1.65	[0.90, 3.01]	44%	0.10
Syed A et al. 2013	1.17	[0.37, 3.72]	67%	0.79
Yamada A et al. 2017	1.54	[0.71, 3.35]	63%	0.28
Ferrante M et al. 2017	1.54	[0.62, 3.82]	62%	0.35
Yamada A et al. 2017	1.16	[0.58, 2.30]	51%	0.68
Surgical site infectious complications(within 4 weeks)				
Excluded study	OR	95%CI	I²	P values
Kotze PG et al. 2017	0.66	[0.35, 1.28]	71%	0.22
Kotze PG et al. 2017(AD)	0.84	[0.46, 1.53]	72%	0.57
Lightner AL et al. 2017(CD)	0.76	[0.38, 1.51]	75%	0.43
Syed A et al. 2013	0.67	[0.34, 1.32]	68%	0.25
Uchino M et al. 2013(CD)	0.91	[0.51, 1.64]	66%	0.51

Yamada A et al. 2017	0.79	[0.42, 1.49]	75%	0.46
Ferrante M et al. 2009	0.83	[0.45, 1.55]	73%	0.56
Ferrante M et al. 2017	0.74	[0.37, 1.46]	75%	0.38
Uchino M et al. 2013(UC)	0.86	[0.47, 1.57]	72%	0.61
Yamada A et al. 2017	0.66	[0.37, 1.19]	69%	0.17
Lightner AL et al. 2017(IBD)	0.75	[0.37, 1.51]	75%	0.42

Sensitivity analysis was used for finding the source of heterogeneity by observing the change of heterogeneity after excluding particular study. The Odds ratio (OR), 95% confidence interval (CI), I^2 and P value was shown after excluding the specified study. P value was calculated by Z test in the forest plot. I^2 measured the heterogeneity.

Figure S1 Quality assessment by National Heart, Lung, and Blood Institute Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies. Details of each bias risk assessment for each study are shown. “Yes”, “Not applied”, and “No” were indicated by green, yellow, and red, respectively. Quality Assessment results were as follows. 1. All studies had a clearly specified objective. 2. All studies clearly defined the population. 3. Only one study had a participation rate of eligible patients $\geq 50\%$ due to case matching. 4. All studies appropriately selected patients. 5. No study provided sample size justification/power/variance/effect estimates. 6. All studies measured exposure(s) of interest before outcome(s). 7. All studies had an appropriate time frame. 8. Five studies set different exposure groups according to the time of last anti-TNF- α injection before surgery, generating a recording of "Yes", while the rest were recorded as "NA" without mention. 9. All studies clearly defined exposure measures that were valid, reliable, and consistent. 10. In addition to the time of last preoperative anti-TNF- α injection, three studies repeated testing of anti-TNF- α serum levels in the exposure group, which was labeled as "Yes"; the rest were labeled "No." 11. All studies clearly defined outcomes that were valid, reliable, and consistent. 12. The response to items of outcome assessor blinding to levels of exposure was “No” for four studies that did not have adequate blinding, while the response was “NA” in 23 studies which did not report clear information about blinding. 13. For all studies, loss to follow-up was $\leq 20\%$. 14. Two studies did not use multivariate regression analysis to measure confounding variables, which were indicated as “No”, while the rest measured key confounding variables and adjusted statistically.

	1. Objective Clearly Specified	2. Study Population Clearly Defined	3. Participation Rate of Eligible Patients $\geq 50\%$	4. Patients Selected Appropriately	5. Sample Size Justification/Power/Variance/Effect Estimates Provided	6. Exposure(s) of Interest Measured Before Outcome(s)	7. Appropriate Time Frame	8. Levels of Exposure Examined Appropriately	9. Exposure Measures Clearly Defined, Valid, Reliable and Consistent	10. Exposure(s) Assessed More Than Once Over Time	11. Outcomes Clearly Defined, Valid, Reliable And Consistent	12. Outcome Assessor Blinded	13. Loss to Follow-up $\leq 20\%$	14. Key Confounding Variables Measured and Adjusted Statistically
Appau KA et al. 2008	Yes	Yes	Yes	Yes	No	Yes	Yes	NA	Yes	No	Yes	NA	Yes	Yes
Bregnbak D et al. 2012	Yes	Yes	Yes	Yes	No	Yes	Yes	NA	Yes	No	Yes	NA	Yes	Yes
Canedo J et al. 2011	Yes	Yes	Yes	Yes	No	Yes	Yes	NA	Yes	No	Yes	No	Yes	Yes
Ferrante M et al. 2009	Yes	Yes	Yes	Yes	No	Yes	Yes	NA	Yes	No	Yes	NA	Yes	Yes
Ferrante M et al. 2017	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	NA	Yes	Yes
Gainsbury ML et al. 2011	Yes	Yes	Yes	Yes	No	Yes	Yes	NA	Yes	No	Yes	NA	Yes	Yes
Gu JY et al. 2013	Yes	Yes	Yes	Yes	No	Yes	Yes	NA	Yes	No	Yes	NA	Yes	Yes
Kotze PG et al. 2017	Yes	Yes	Yes	Yes	No	Yes	Yes	NA	Yes	No	Yes	NA	Yes	Yes
Kotze PG et al. 2017(AD)	Yes	Yes	No	Yes	No	Yes	Yes	NA	Yes	Yes	Yes	NA	Yes	Yes
Krane MK et al. 2013	Yes	Yes	Yes	Yes	No	Yes	Yes	NA	Yes	No	Yes	NA	Yes	Yes
Kunitake H et al. 2008	Yes	Yes	Yes	Yes	No	Yes	Yes	NA	Yes	No	Yes	NA	Yes	Yes
Lightner AL et al. 2017(CD)	Yes	Yes	Yes	Yes	No	Yes	Yes	NA	Yes	No	Yes	No	Yes	Yes
Lightner AL et al. 2017(IBM)	Yes	Yes	Yes	Yes	No	Yes	Yes	NA	Yes	No	Yes	NA	Yes	Yes
Myrelid P et al. 2014	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	NA	Yes	Yes
Nelson R et al. 2014	Yes	Yes	Yes	Yes	No	Yes	Yes	NA	Yes	No	Yes	NA	Yes	Yes
Nørgård BM et al. 2012	Yes	Yes	Yes	Yes	No	Yes	Yes	NA	Yes	No	Yes	NA	Yes	No
Nørgård BM et al. 2014	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	NA	Yes	No
Rizzo G et al. 2011	Yes	Yes	Yes	Yes	No	Yes	Yes	NA	Yes	No	Yes	NA	Yes	Yes
Shwaartz C et al. 2016	Yes	Yes	Yes	Yes	No	Yes	Yes	NA	Yes	No	Yes	NA	Yes	Yes
Syed A et al. 2013	Yes	Yes	Yes	Yes	No	Yes	Yes	NA	Yes	No	Yes	No	Yes	Yes
Uchino M et al. 2013(UC)	Yes	Yes	Yes	Yes	No	Yes	Yes	NA	Yes	No	Yes	NA	Yes	Yes
Uchino M et al. 2013(CD)	Yes	Yes	Yes	Yes	No	Yes	Yes	NA	Yes	No	Yes	NA	Yes	Yes
Ward ST et al. 2017	Yes	Yes	Yes	Yes	No	Yes	Yes	NA	Yes	No	Yes	NA	Yes	Yes
Waterman M et al. 2013	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	NA	Yes	Yes
Yamada A et al. 2017	Yes	Yes	Yes	Yes	No	Yes	Yes	NA	Yes	No	Yes	NA	Yes	Yes
Yamamoto T et al. 2016	Yes	Yes	Yes	Yes	No	Yes	Yes	NA	Yes	No	Yes	No	Yes	Yes
Zittan E et al. 2016	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	NA	Yes	Yes

Figure S2 Venn diagram showing characteristics of 27 included studies. Studies were grouped according to last preoperative anti-TNF- α injection time. Six of the studies formed a "within 4 weeks" cohort, while eight studies formed the "within 8 weeks" cohort. Nineteen studies formed the "within 8 weeks" cohort. Some studies had multiple different time cohorts, as shown in the intersecting areas. The disease type investigated in each study is also indicated by blue for Chron's disease, yellow for ulcerative colitis, and green for inflammatory bowel disease.

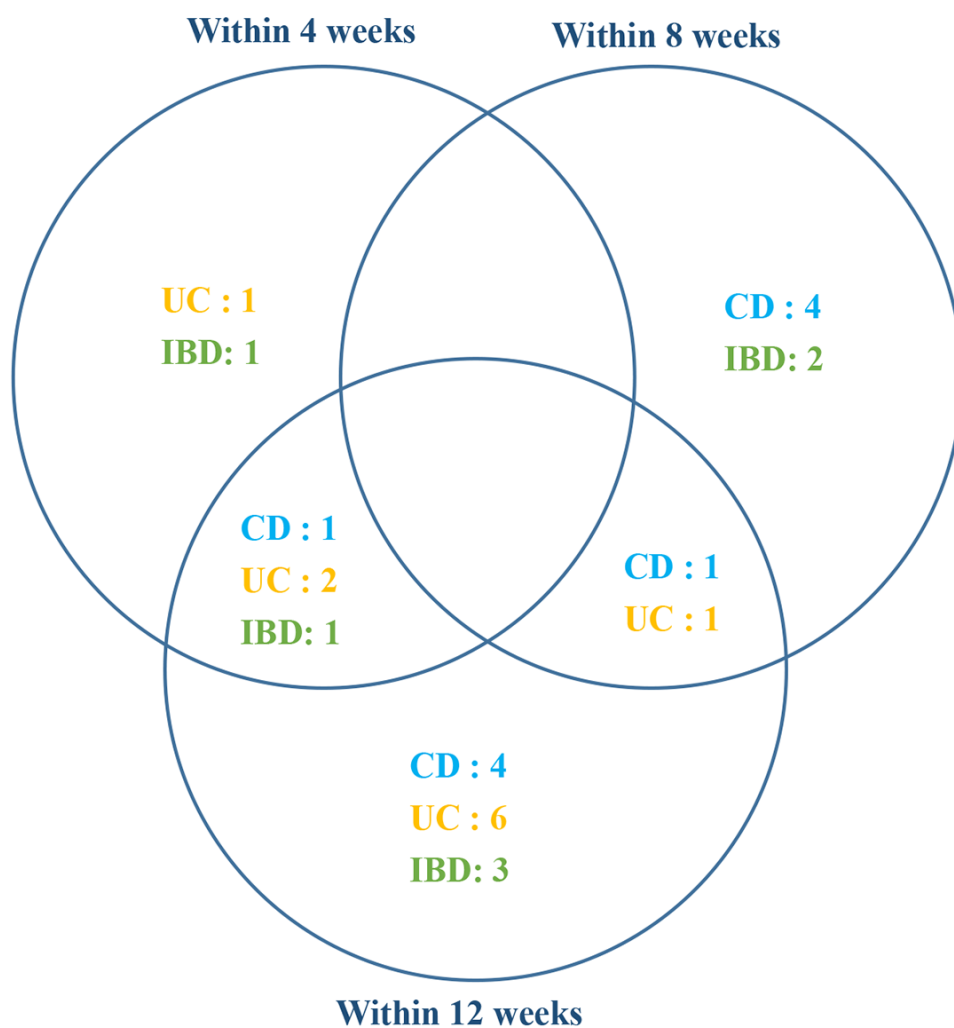


Figure S3 Different preoperative anti-tumor necrosis factor alpha agents (anti-TNF- α) windows in within 2 weeks vs. greater than 2 weeks: Forest plot for anastomotic leakage.

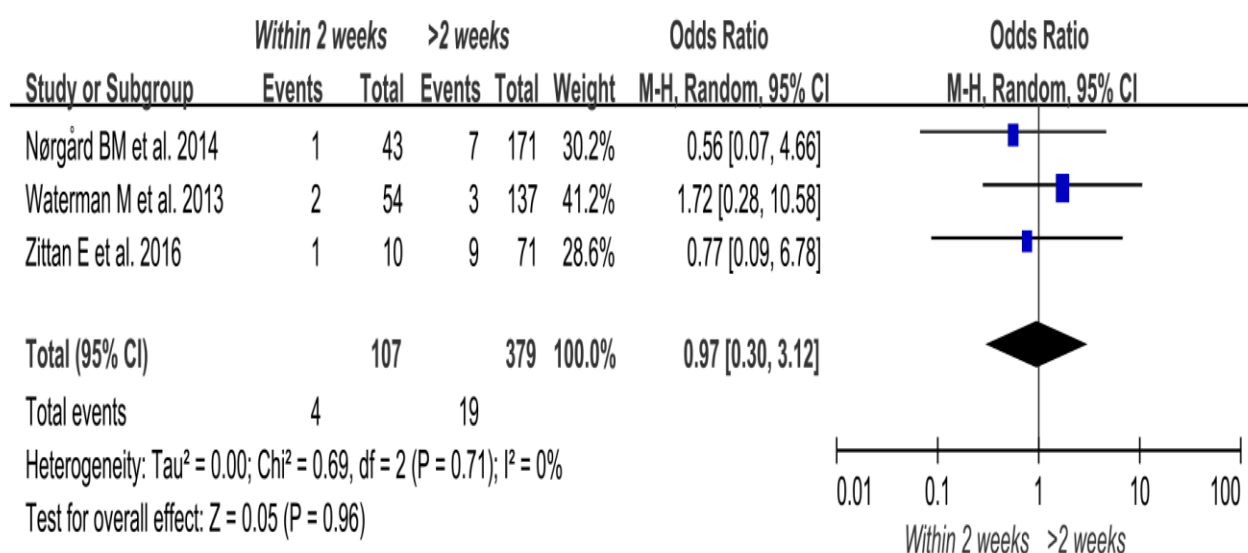


Figure S4 Different preoperative anti-tumor necrosis factor alpha agents (anti-TNF- α) windows in within 8 weeks vs. greater than 8 weeks: Forest plot for anastomotic leakage.

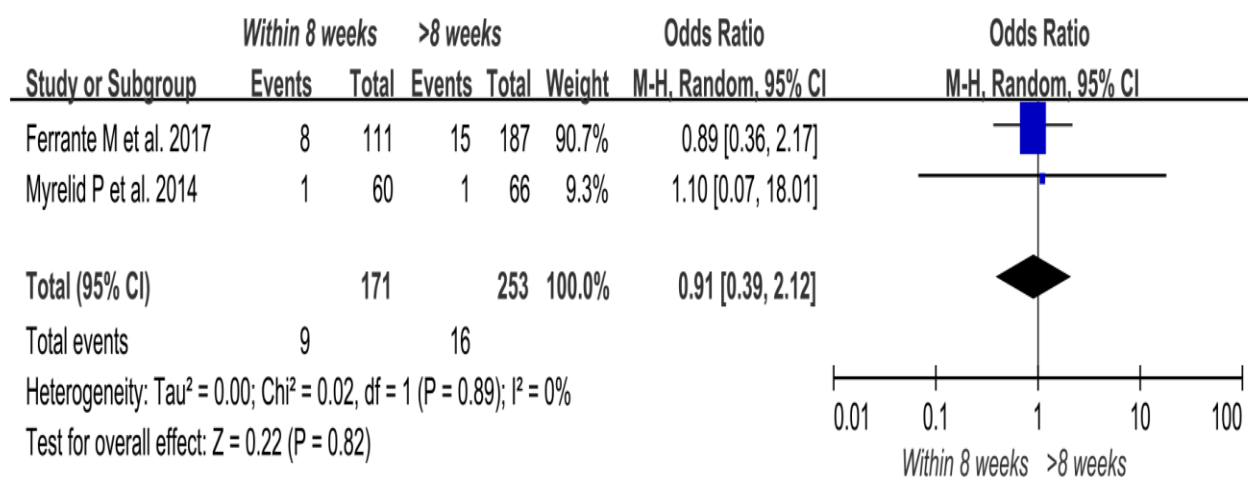
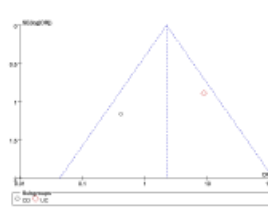
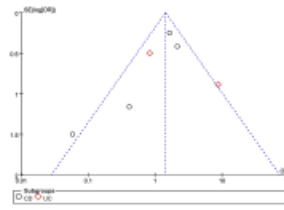


Figure S5 Funnel plots for all forest plots.

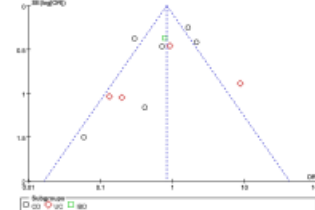
SSI



A

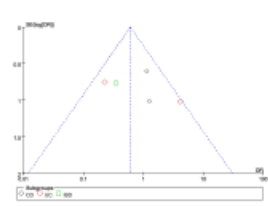


B

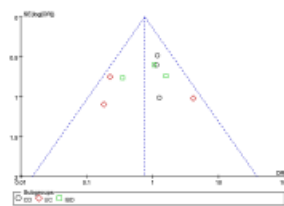


C

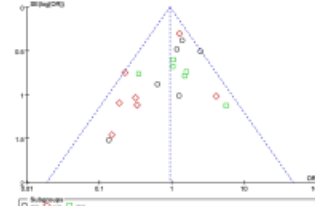
Anastomotic leak



A

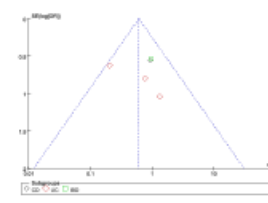


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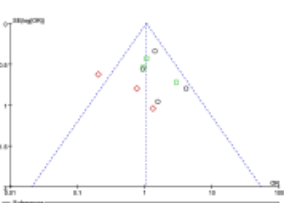


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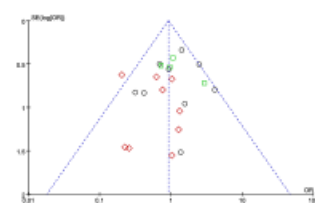
Abscess



A

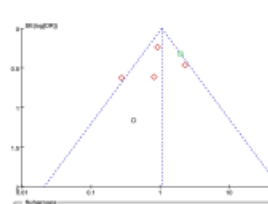


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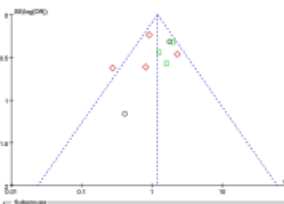


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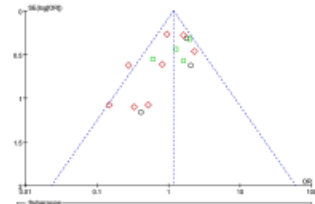
Wound infection



A

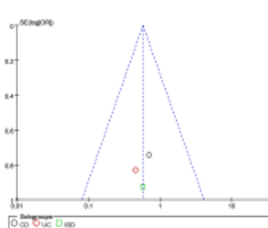


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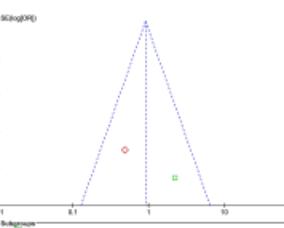


C

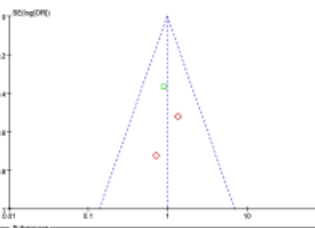
Different time Anti-TNF-a using



A



B



C