

Appendix 9

Data tables

TABLE 53 Summary of outcomes: safety (perioperative)

Study	Outcome reported as	Robotic, n/N (%) ^a	Laparoscopic, n/N (%) ^a	Open, n/N (%) ^a	Notes
Equipment failure					
Hu 2006 ⁹²	Robot malfunction (unresponsive and refractory to troubleshooting measures)	2/333 (0.6)	0		First case converted to laparoscopic radical prostatectomy and second case occurred after second robot replacement
Menon 2002 ⁹⁵	Reported as excluded from analysis and not as equipment failure	Not reported	8; initial problems with the voice recognition system of the AESOP camera holder		'The problem was corrected after the first 4 cases. Inclusion of these 8 patients in analysis would have increased the average operative times for laparoscopic prostatectomy by 10 mins'
Converted to other intervention					
Bhayani 2003 ¹²⁴	Converted to other intervention		3/36 (8.3)	0/24	
Chan 2008 ¹¹⁹	Converted to other intervention	6/660 (0.9), to open			Secondary report of primary study Barocas 2010 ¹⁰⁴
Drouin 2009 ¹⁰¹	Converted to other intervention	0/71	1/85 (1.2)	0/83	
Ghavamian 2006 ⁷⁸	Converted to other intervention		0/70	0/70	
Greco 2010 ¹²⁹	Converted to other intervention		0/150	0/150	
Guazzoni 2006 ⁹⁰	Converted to other intervention		0/60		RCT
Hu 2006 ⁹²	Converted to other intervention	0/322	3/358 (0.8), first 3, to open		
Jurczok 2007 ¹³¹	Converted to other intervention		0/163	0/240	
Martorana 2004 ¹³⁴	Converted to other intervention		0/50	0/50	
Menon 2002 ⁹⁵	Converted to other intervention	0/40, to open	1/40 (2.5), to open		
Namiki 2005 ¹³⁵	Converted to other intervention		0/45	0/121	
Ou 2009 ¹¹³	Converted to other intervention	2/30 (6.7)		0/30	
Remzi 2005 ¹³⁹	Converted to other intervention		1/80 (1.3)	0/41	
Rozet 2007 ⁹⁶	Converted to other intervention	4/133 (3.0)	0/133		
Soric 2004 ¹⁴³	Converted to other intervention		3/26 (11.5)	0/26	
Tewari 2003 ¹¹⁶	Converted to other intervention	0/200		0/100	
Trabulsi 2008 ⁹⁸	Converted to other intervention	0/50	7/197 (3.6)		
White 2009 ¹¹⁸	Converted to other intervention	0/50		Not reported	

continued

TABLE 53 Summary of outcomes: safety (perioperative) (*continued*)

Study	Outcome reported as	Robotic, n/N (%) ^a	Laparoscopic, n/N (%) ^a	Open, n/N (%) ^a	Notes
Blood transfusion					
Al-Shaiji 2010 ¹²¹	Blood transfusion		3/70 (4.3)	42/70 (60.0)	
Anastasiadis 2003 ¹²²	Blood transfusion during surgery		6/230 (2.6)	6/70 (8.6)	
Artibani 2003 ¹²³	Blood transfusion		45/71 (63)	17/50 (34.0)	
Bolenz 2010 ¹⁰⁰	Blood transfusion	12/262 (4.6)	4/211 (1.9)	32/156 (20.5)	
Brown 2004 ¹²⁵	Blood transfusion		1/60 (1.7)	31/60 (51.7)	
Carlsson 2010 ¹⁰⁴	Blood transfusion	58/1253 (4.6)		112/485 (23.1)	
Chan 2008 ¹¹⁹	Blood transfusion	5/660 (0.8)		11/340 (3.2)	
Doumerc 2010 ¹⁰⁵	Blood transfusion	2/212 (0.9)		10/502 (2.0)	
Drouin 2009 ¹⁰¹	Blood transfusion	4/71 (5.6)	5/85 (5.9)	8/83 (9.6)	
Ficarra 2009 ¹⁰⁶	Blood transfusion	2/103 (1.9)		15/105 (14.3)	
Fornara 2004 ¹²⁷	Blood transfusion		2/32 (6.3)	6/32 (18.8)	
Fracalanza 2008 ¹⁰⁷	Blood transfusion				
	During surgery	6/35 (17.1)		9/26 (34.6)	
	After surgery	1/35 (2.9)		3/26 (11.5)	
Ghavamian 2006 ¹²⁸	Blood transfusion		5/70 (7.1)	22/70 (31.4)	
Gosseine 2009 ⁹¹	Blood transfusion	4/122 (3.3)	8/125 (6.4)		
Greco 2010 ¹²⁹	Blood transfusion		3/150 (2.0)	9/150 (6.0)	
Guazzoni 2006 ⁹⁰	Blood transfusion				RCT
	Homologous		0/60	5/60 (8.3)	
	Autologous		8/60 (13.3)	27/60 (45.0)	
Hu 2006 ⁹²	Blood transfusion	5/322 (1.6)	8/358 (2.2)		
Joseph 2007 ⁹⁴	Blood transfusion	10/754 (1.3)	35/800 (4.4)		Abstract
Jurczok 2007 ¹³¹	Blood transfusion		5/163 (3)	22/240 (9)	n/N calculated from reported percentages
Kim 2007 ¹³²	Blood transfusion		7/30 (23.3)	10/45 (22.2)	
Kordan 2010 ¹²⁰	Blood transfusion	7/830 (0.8)		14/414 (3.4)	Secondary to Barocas 2010 ¹⁰⁴
Krambeck 2008 ¹⁰⁸	Blood transfusion	15/294 (5.1)		77/588 (13.1)	
Lama 2009 ¹³³	Blood transfusion		7/56 (12.5)	23/59 (39.0)	
Martorana 2004 ¹³⁴	Blood transfusion		1/50 (2.0)	5/50 (10.0)	
Menon 2002 ⁹⁵	Blood transfusion	0/40	1/40 (2.5)		
Nadler 2010 ¹¹²	Blood transfusion	10/50 (20.0)		45/50 (90.0)	
Ou 2009 ¹¹³	Blood transfusion	4/30 (13.3)		18/30 (60.0)	
Poulakis 2007 ¹³⁷	Blood transfusion (unit)		Group I: 2/72 (2.7) Group II: 3/132 (2.3)	13/70 (18.6)	Groups I and II split by age (data not combined)
Rozet 2007 ⁹⁶	Blood transfusion	13/133 (9.8)	4/133 (3.0)		
Salomon 2002 ¹⁴⁰	Blood transfusion		3/155 (1.9)	31/151 (20.5)	
Soric 2004 ¹⁴³	Blood transfusion (ml), mean		130	240	
Tewari 2003 ¹¹⁶	Blood transfusion	0/200		67/100 (67.0)	
Operating time, minutes (convert hours to minutes: hours x 60 = minutes)					
Al-Shaiji 2010 ¹²¹	Operating time, mean (range)		232 (132–348)	170 (108–330)	
Bhayani 2003 ¹²⁴	Operating time, mean (SD)		348 (72)	168 (33)	
Bolenz 2009 ¹⁰² (secondary to Bolenz 2010 ¹⁰⁰)	Operating time, median	198	235	225	

TABLE 53 Summary of outcomes: safety (perioperative) (*continued*)

Study	Outcome reported as	Robotic, n/N (%) ^a	Laparoscopic, n/N (%) ^a	Open, n/N (%) ^a	Notes
Brown 2004 ¹²⁵	Operating time, mean (median)		348 (330)	Not reported	From time of skin incision to time of completion of wound closure
Chan 2008 ¹¹⁹	Operating time, range	63–483		82–245	Range reported from two groups of different prostate size
Doumerc 2010 ¹⁰⁵	Operating time, mean (range)	192 (119–525)		148 (75–330)	
Drouin 2009 ¹⁰¹	Operating time, mean (SD)	199.6 (36.6)	257.3 (94.3)	208.5 (76)	
Ficarra 2009 ¹⁰⁶	Operating time, median	185		135	
Fornara 2004 ¹²⁷	Operating time, median (range)		220 (180–360)	140 (120–190)	
Fracalanza 2008 ¹⁰⁷	Operating time, mean (SD)	195.6 (45)		127.2 (31.7)	Robotics: insertion of the Veress needle to the suture of the last laparoscopic port; open: from skin incision to suture
Ghavamian 2006 ¹²⁸	Operating time, mean (SD)		246.4 (46.1)	181.8 (18.7)	Skin incision to closure
Gosseine 2009 ¹	Operating time, mean	237	241		
Greco 2010 ¹²⁹	Operating time, mean (range)		165 (90–240)	120 (60–180)	
Guazzoni 2006 ⁹⁰	Operating time, mean (SD)		N235 (49.9)	170 (34.2)	RCT Total time in the operating room from entry to exit
Hu 2006 ⁹²	Operating time, median (range)	186 (114–528)	246 (150–768)		
Joseph 2007 ⁹⁴	Operating time, mean (range)	194 (91–486)	179 (75–450)		Abstract Skin incision to closure
Jurczok 2007 ¹³¹	Operating time, median (range)		180 (120–240)	120 (80–190)	
Kim 2007 ¹³²	Operating time, mean (SD)		335.9 (93.7)	201.9 (62.8)	
Krambeck 2008 ¹⁰⁸	Operating time, median (25th–75th percentile)	236 (204–285)		204 (162–268)	
Lama 2009 ¹³³	Operating time, mean (SD)		203 (52)	151 (30)	
Martorana 2004 ¹³⁴	Operating time, mean (range)		358 (180–565)	159 (115–225)	
Menon 2002 ⁹⁵	Operating time, mean (SD)	274 (94.3)	258 (80.3)		Start of dissection to closure
Nadler 2010 ¹¹²	Operating time, mean (range)	341 (175–591)		235 (152–352)	
Ou 2009 ¹¹³	Operating time, mean (SD)	205 (103)		213 (37)	
Poulakis 2007 ¹³⁷	Operating time, mean (SD)		Group I: 144 (36) Group II: 144 (30)	150 (30)	Two age groups
Raventos Busquets 2007 ¹³⁸	Operating time, mean (SD)		172.3 (43.7)	145.1 (32.9)	
Remzi 2005 ¹³⁹	Operating time, mean (SD)		Transperitoneal: 279 (70) Extraperitoneal: 217 (51)	195 (72)	
Rocco 2009 ¹¹⁴	Operating time, median (range)	215 (165–450)		160 (90–240)	Skin incision to closure
Rozet 2007 ⁹⁶	Operating time, mean (range)	166 (90–300)	160 (90–270)		

continued

TABLE 53 Summary of outcomes: safety (perioperative) (*continued*)

Study	Outcome reported as	Robotic, n/N (%) ^a	Laparoscopic, n/N (%) ^a	Open, n/N (%) ^a	Notes
<i>continued</i>					
Salomon 2002 ¹⁴⁰	Operating time, mean, SD, (range)		266, 73 (120–510)	Retropubic: 181, 46 (120–360) Perineal: 163, 58 (80–325)	Total operative time included pelvic lymphadenectomy
Soric 2004 ¹⁴³	Operating time, mean (range)		302 (183–513)	272 (197–304)	
Sundaram 2004 ⁹⁷	Operating time, mean (range)	290 (210–340)	394 (240–480)		Abstract
Truesdale 2010 ¹¹⁷	Operating time, mean (SD)	153.4 (51.3)		204 (32.9)	
Wagner 2007 ¹⁴⁶	Operating time, mean (SD)		282 (53.4)	162 (39.0)	
Hospital stay, days					
Al-Shajji 2010 ¹²¹	Hospital stay, mean, SD, (range)		3.4, 1.84 (2–12)	5.6, 1.49 (2–10)	
Artibani 2003 ¹²³	Hospital stay, mean, SD, (range)		7.2, 3.4 (2–19)	10.2, 2 (7–15)	
Bhayani 2003 ¹²⁴	Hospital stay, mean (SD)		2.97 (0.55)	3.04 (0.21)	
Bolenz 2009 ¹⁰²	Hospital stay, median	2	1	2	
Brown 2004 ¹²⁵	Hospital stay, mean, median (range)		2.8, 2 (6–15)	3, 3 (2–5)	
Chan 2008 ¹¹⁹	Hospital stay, range	0.6–8.8		0.7–3.6	Range reported from two groups of different prostate size
Doumerc 2010 ¹⁰⁵	Hospital stay, mean (range)	2.8 (2–7)		505 (3–10)	
Ficarra 2009 ¹⁰⁶	Hospital stay, median (range)	6 (5–8)		7 (6–9)	
Fornara 2004 ¹²⁷	Hospital stay, mean		12.4	11.2	
Fracalanza 2008 ¹⁰⁷	Hospital stay, median (range)	5 (9–6)		8 (5–9)	
Ghavamian 2006 ¹²⁸	Hospital stay, mean		2	3	
Gosseine 2009 ⁹¹	Hospital stay, mean (SD)	9 (2.1)	10.2 (3.2)		
Jurczok 2007 ¹³¹	Hospital stay, median		9.4	11.2	
Kim 2007 ¹³²	Hospital stay, mean (SD)		6.7 (3.7)	6.9 (2.6)	
Krambeck 2008 ¹⁰⁸	Hospital stay (days), n/N (%)				
	1	86/294 (29.3)		114/588 (19.4)	
	2	176/294 (59.9)		400/588 (68.0)	
	3–6	31/294 (10.5)		65/588 (11.1)	
	≥7	1/294 (0.3)		9/588 (1.5)	
Lama 2009 ¹³³	Hospital stay, mean (SD)		7.3 (4.7)	10.7 (9.2)	
Martorana 2004 ¹³⁴	Hospital stay, mean		5 (3–39)	6.9 (4–17)	
Nadler 2010 ¹¹²	Hospital stay, mean (range)	2.5 (1.12)		2.8 (2–6)	
Ou 2009 ¹¹³	Hospital stay, mean (SD)	7.3 (2.3)		8.37 (2.2)	
Poulakis 2007 ¹³⁷	Hospital stay, mean (SD)		Group I: 9 (2) Group II: 9 (3)	11 (3)	Groups I and II are two age groups (data not combined)
Raventos Busquets 2007 ¹³⁸	Hospital stay, mean (SD)		4.8 (1.3)	5.79 (1.67)	
Remzi 2005 ¹³⁹	Hospital stay, mean (SD)		Transperitoneal: 7 (2) Extraperitoneal: 7 (2)	10 (4)	
Rocco 2009 ¹¹⁴	Hospital stay, mean (range)	3 (2–12)		6 (3–16)	
Rozet 2007 ⁹⁶	Hospital stay, mean (range)	5.4 (3–26)	4.9 (3–20)		

TABLE 53 Summary of outcomes: safety (perioperative) (*continued*)

Study	Outcome reported as	Robotic, n/N (%) ^a	Laparoscopic, n/N (%) ^a	Open, n/N (%) ^a	Notes
Salomon 2002 ¹⁴⁰	Hospital stay, mean, SD (range)		6.8, 3 (4–21)	Retropubic: 12.1, 7.6 (5–55) Perineal: 7.9, 4.1 (2–22)	
Soric 2004 ¹⁴³	Hospital stay, mean		12	12	
Sundaram 2004 ⁹⁷	Hospital stay, mean (range)	1.3 (1–3)	2.2 (1–3)		Abstract
Tewari 2003 ¹¹⁶	Hospital stay, mean (range)	1.2 (<1–5)		3.5 (3–6)	
Proportion of included men discharged from hospital within the stated interval					
Guazzoni 2006 ⁹⁰	Discharged on day 6 with or without catheter		54/60 (90.0)	52/60 (86.7)	RCT Delayed discharge was due to fever, persistent lymphorrhoea and rectal damage
Menon 2002 ⁹⁵	Discharge home < 1 day	32/40 (80.0)	26/40 (65.0)		
Readmission					
Brown 2004 ¹²⁵	Readmission due to surgical complications		0/60	1/60 (1.7)	Because of deep-vein thrombosis
Need critical care					
No studies					
Bladder neck stenosis/anastomotic stricture					
Bhayani 2003 ¹²⁴	Bladder neck contracture		0/33	6/24 (25.0)	
Brown 2004 ¹²⁵	Bladder neck contracture		0/60	2/60 (3.3)	
Carlsson 2010 ¹⁰⁴	Bladder neck contracture (30 days–15 months)	3/1253 (0.2)		22/485 (4.5)	
Dahl 2009 ¹²⁶	Bladder neck contracture		2/104 (2.0)	0/102	
Ficarra 2009 ¹⁰⁶	Stenosis of the urethrovesical anastomosis	3/103 (3.0)		6/105 (5.7)	
Ghavamian 2006 ¹²⁸	Bladder neck contracture		1/70 (1.4)	3/70 (4.3)	
Hu 2006 ⁹³	Bladder neck contracture	2/322 (0.6)	8/358 (2.2)		
Krambeck 2008 ¹⁰⁸	Bladder neck contracture, 1 year	3/248 (1.2)		23/492 (4.7)	
	Stricture, 1 year	8/286 (2.8)		6/492 (1.2)	
Lama 2009 ¹³³	Bladder neck stenosis		5/56 (8.9)	1/59 (1.7)	
Nadler 2010 ¹¹²	Bladder neck contracture	2/50 (4.0)		7/50 (14.0)	
Ou 2009 ¹¹³	Mild vesicourethral anastomosis stricture	1/30 (3.3)		0/30	
Remzi 2005 ¹³⁹	Anastomotic stricture		3/80 (3.8)	4/41 (9.8)	
Wagner 2007 ¹⁴⁶	Bladder neck contracture		2/75 (2.7)	12/75 (16.0)	
Catheterisation, days					
Anastasiadis 2003 ¹²²	Catheterisation, mean		5.8	7.8	
Artibani 2003 ¹²³	Catheterisation, mean, SD (range)		8, 2.8 (4–18)	8.4, 0.9 (7–12)	
Bhayani 2003 ¹²⁴	Catheterisation, mean (SD)		14 (6.9)	19 (1.22)	
Doumerc 2010 ¹⁰⁵	Catheterisation, mean (range)	6.3 (6–21)		7.9 (6–20)	
Drouin 2009 ¹⁰¹	Catheterisation, mean (range)	8.1 (3–31)	8.9 (3–91)	14.7 (6–28)	

continued

TABLE 53 Summary of outcomes: safety (perioperative) (*continued*)

Study	Outcome reported as	Robotic, <i>n/N</i> (%) ^a	Laparoscopic, <i>n/N</i> (%) ^a	Open, <i>n/N</i> (%) ^a	Notes
Ficarra 2009 ¹⁰⁶	Catheterisation, median (range)	5 (4–7)		6 (5–12)	
Fornara 2004 ¹²⁷	Catheterisation, mean		17.9	13.2	
Gosseine 2009 ⁹¹	Catheterisation, mean	5.5	6.5		
Greco 2010 ¹²⁹	Catheterisation, mean		7	9	
Guazzoni 2006 ⁹⁰	5-day catheterisation, <i>n/N</i> (%)		52/60 (86.7)	40/60 (66.7)	RCT Patients requiring 5 days of catheterisation
Joseph 2007 ⁹⁴	Catheterisation, mean (range)	10.2 (7–21)	6.1 (1–48)		Abstract
Jurczok 2007 ¹³¹	Catheterisation, median or mean		8.9	10.2	
Kim 2007 ¹³²	Catheterisation, mean (SD)		10.7 (7.8)	12.1 (6.7)	
Lama 2009 ¹³³	Catheterisation, mean (SD)		8.8 (3.9)	14.9 (6.2)	
Martorana 2004 ¹³⁴	Catheterisation, mean (range)		13 (6–36)	15 (11–21)	
Ou 2009 ¹¹³	Catheterisation, mean (SD)	7.7 (2.1)		9.2 (2.9)	
Poulakis 2007 ¹³⁷	Catheterisation, mean (SD)		Group I: 7 (3) Group II: 7 (2)	22 (6)	Groups I and II are two age groups (data not combined)
Remzi 2005 ¹³⁹	Catheterisation, mean (range)		Transperitoneal: 7.2 (6–23) Extraperitoneal: 6.1 (4–24)	10.9 (8–35)	
Rocco 2009 ¹¹⁴	Catheterisation, mean (range)	6 (4–30)		7 (4–35)	
Rozet 2007 ⁹⁶	Catheterisation, mean (range)	9.2 (6–29)	9.0 (7–31)		
Salomon 2002 ¹⁴⁰	Catheterisation, mean, SD (range)		5.7, 4.8 (2–30)	Retropubic: 12.1, 8.1 (4–45) Perineal: 11.3, 4.6 (3–30)	
Soric 2004 ¹⁴³	Catheterisation, mean		10	8	
Tewari 2003 ¹¹⁶	Catheterisation, mean (range)	7 (1–18)		15.8 (7–28)	
Anastomotic leak					
Brown 2004 ¹²⁵	Anastomotic leak		9/60 (15.0)	2/60 (3.3)	
Carlsson 2010 ¹⁰⁴	Anastomotic leak	13/1253 (1.0)		8/485 (1.6)	< 30 days postoperatively
Dahl 2009 ¹²⁶	Anastomotic leak		2/104 (1.9)	0/102	> 200 ml/day
Drouin 2009 ¹⁰¹	Anastomotic leak	0/71	2/85 (2.4)	1/83 (1.2)	
Ghavamian 2006 ¹²⁸	Anastomotic leak		2/70 (2.9)	3/70 (4.3)	
Guazzoni 2006 ⁹⁰	Anastomotic leak		8/60 (13.3)	20/60 (33.3)	RCT
Joseph 2007 ⁹⁴	Urine leak at cystogram	12/754 (1.6)	112/800 (14.0)		Abstract
Kim 2007 ¹³²	Anastomotic leak		5/30 (16.7)	Not reported	> 14 days; managed by prolonged catheterisation
Martorana 2004 ¹³⁴	Anastomotic leak		1/50 (2.0)	2/50 (4.0)	
Nadler 2010 ¹¹²	Anastomotic leak	2/50 (4.0)		2/50 (4.0)	
Ou 2009 ¹¹³	Mild vesicourethral anastomosis leaking	0/30		2/30 (6.7)	
Remzi 2005 ¹³⁹	Anastomotic leak		8/80 (10.0)	6/41 (14.6)	
Rozet 2007 ⁹⁶	Anastomotic leak	1/133 (0.8)	1/133 (0.8)		
Salomon 2002 ¹⁴⁰	Anastomotic leak		4/155 (2.6)	2/151 (1.3)	
Sundaram 2004 ⁹⁷	Anastomotic leak	0/10	1/10 (10.0)		Abstract

TABLE 53 Summary of outcomes: safety (perioperative) (*continued*)

Study	Outcome reported as	Robotic, n/N (%) ^a	Laparoscopic, n/N (%) ^a	Open, n/N (%) ^a	Notes
Hernia (port/incision sites)					
Menon 2002 ⁹⁵	Hernia port/incision site	Not reported	1/40 (2.5)		
Nadler 2010 ¹¹²	Inguinal hernia	0/50		1/50 (2.0)	
Tewari 2003 ¹¹⁶	Wound dehiscence/hernia	2/200 (1.0)		1/100 (1.0)	
Infection					
Artibani 2003 ¹²³	Fever		15	7	
	Wound infection		0	1	
	Port site infection		1	0	
	Subtotal		16/71 (22.5)	8/50 (16.0)	
Brown 2004 ¹²⁵	Superficial wound infection		0/60	2/60 (3.3)	
Carlsson 2010 ¹⁰⁴	Infection	18		44	All occurred <30 days postoperatively
	Pneumonia	0		4	
	Infected lymphocele	1		3	
	Wound infection	6		29	
	Subtotal	25/1253 (2.0)		80/485 (16.0)	
Dahl 2009 ¹²⁶	Wound infection		1/104 (1.0)	0/102	
Drouin 2009 ¹⁰¹	Urinary infection	1/71 (1.4)	0/85	6/83 (7.2)	
Fornara 2004 ¹²⁷	Wound infection		0/32	2/32 (6.3)	
Ghavamian 2006 ¹²⁸	Urinary tract infection		1/70 (1.4)	1/70 (1.4)	
Hu 2006 ⁹²	Cellulitis	6	12		
	Orchitis	1	1		
	<i>Clostridium difficile</i> enterocolitis	0	1		
	Pneumonia	0	1		
	Bacterial peritonitis	0	1		
	Subtotal	7/322 (2.2)	16/358 (4.5)		
	Jurczok 2007 ¹³¹	Wound infection		5/163 (3.1)	8/240 (3.4)
Krambeck 2008 ¹⁰⁸	Sepsis, 1 month	0		1	
	Urinary tract infection, 1 month	3		6	
	Abdominal abscess, 1 year	0		2	
	Subtotal	3/248 (1.2)		9/249 (3.6)	
Rozet 2007 ⁹⁶	Wound abscess	1	0		
	Infected pelvic haematoma	3	2		
	Urinary infection	6	1		
	Urinary sepsis	2	2		
	Subtotal	12/133 (9.0)	5/133 (3.8)		
Salomon 2002 ¹⁴⁰	Wound infection		2/155 (1.3)	12/151 (7.9)	
	Sepsis		0/155	2/151 (1.3)	
	Subtotal		2/155 (1.3)	14/151 (9.3)	
Tewari 2003 ¹¹⁶	Postoperative fever/pneumonia	0/200		4/100 (4.0)	
Organ injury					
Artibani 2003 ¹²³	Rectal injury		2	0	
	Transient peripheral nerve injury		2	0	
	Subtotal		4/71 (5.6)	0/50	

continued

TABLE 53 Summary of outcomes: safety (perioperative) (*continued*)

Study	Outcome reported as	Robotic, n/N (%) ^a	Laparoscopic, n/N (%) ^a	Open, n/N (%) ^a	Notes
Bhayani 2003 ¹²⁴	Epigastric artery injury		1/33 (3.0)	0/24	
Brown 2004 ¹²⁵	Ureteral injury		2/60 (3.3)	0/60	One required reoperation
Carlsson 2010 ¹⁰⁴	Rectal injury	2		8	
	Small bowel injury	1		0	
	Ureteral injury	1		0	
	Femoral nerve injury	2		0	
	Obturator nerve injury	0		2	
	Subtotal	6/1253 (0.5)		10/485 (2.1)	
Doumerc 2010 ¹⁰⁵	Bowel injury	1/212 (0.5)		0/502	
Drouin 2009 ¹⁰¹	Rectal injury	0/71	1/85 (1.2)	1/83 (1.2)	
Ficarra 2009 ¹⁰⁶	Colon lesion	1		0	
	Rectal lesion	1		0	
	Subtotal	2/103 (1.9)		0/105	
Fornara 2004 ¹²⁷	Rectal lesion		1/32 (3.1)	0/32 (0)	
Ghavamian 2006 ¹²⁸	Bladder injury		1/70 (1.4)	0/70	
	Inferior epigastric injury		1/70 (1.4)	0/70	
	Subtotal		2/70 (2.9)	0/70	
Greco 2010 ¹²⁹	Rectal injury		2/150 (1.3)	1/150 (0.7)	
Guazzoni 2006 ⁹⁰	Rectal injury		1/60 (1.7)	Not reported	RCT Rectal injury repaired with interrupted sutures intraoperatively
Hu 2006 ⁹²	Artery injury	0	3		
	Nerve injury	0	4		
	Intraoperative heocolonic injury	2	1		
	Intraoperative urethral injury	1	1		
	Intraoperative rectal injury	0	7		
	Rectourethral fistulas	0	7		
Subtotal	3/322 (0.9)	23/358 (6.4)			
Kim 2007 ¹³²	Rectal injury		1/30 (3.3)	Not reported	Managed by laparoscopic repair
	Epigastric vessel injury		1/30 (3.3)		Managed by simple closure
Lama 2009 ¹³³	Rectal perforation		0/56	1/59 (1.7)	
Martorana 2004 ¹³⁴	Epigastric vessel injury		1/50 (2.0)	0/50	
	Bladder wall lesion		1/50 (2.0)	0/50	
	Subtotal		2/50 (4.0)	0/50	
Ou 2009 ¹¹³	Bladder injury and vesicourethral anastomosis tear	1		0	
	Urinary bladder injury	1		0	
	Rectal injury	0		1	
	Subtotal	2/30 (6.7)		1/30 (3.3)	
Remzi 2005 ¹³⁹	Rectal injury		1/80 (1.3)	1/41 (2.4)	Repaired intraoperatively
Salomon 2002 ¹⁴⁰	Ureteral injury		1/155 (0.6)	0/151	
	Rectal injury		3/155 (1.9)	3/151 (2.0)	
	Subtotal		4/155 (2.6)	3/151 (2.0)	

TABLE 53 Summary of outcomes: safety (perioperative) (*continued*)

Study	Outcome reported as	Robotic, n/N (%) ^a	Laparoscopic, n/N (%) ^a	Open, n/N (%) ^a	Notes
Soric 2004 ¹⁴³	Ureter wound		2/26 (7.7)	Not reported	
Tewari 2003 ¹¹⁶	Rectal injuries	0/200		1/100 (1.0)	
Ileus					
Artibani 2003 ¹²³	Ileus		1/71 (1.4)	0/50	
Brown 2004 ¹²⁵	Prolonged ileus		2/60 (3.3)	3/60 (5.0)	
Ficarra 2009 ¹⁰⁶	Ileus	1/103 (1.0)		1/105 (1.0)	
Ghavamian 2006 ¹²⁸	Ileus		2/70 (2.9)	1/70 (1.4)	
Hu 2006 ⁹²	Ileus	9/322 (2.8)	19/358 (5.3)		
Krambeck 2008 ¹⁰⁸	Ileus, 1 month	5/286 (1.7)		10/564 (1.8)	
Martorana 2004 ¹³⁴	Ileus		1/50 (2.0)	0/50	
Menon 2002 ⁹⁵	Ileus	1/40 (2.5), transient	1/40 (2.5), paralytic		
Nadler 2010 ¹¹²	Ileus	2/50 (4.0)		0/50	
Remzi 2005 ¹³⁹	Ileus		1/80 (1.3)	0/41	
Salomon 2002 ¹⁴⁰	Ileus		4/155 (2.6)	0/151	
Tewari 2003 ¹¹⁶	Ileus	3/200 (1.5)		3/100 (3.0)	
Deep-vein thrombosis					
Brown 2004 ¹²⁵	Deep-vein thrombosis		0/60	2/60 (3.3)	
Ghavamian 2006 ¹²⁸	Deep-vein thrombosis		1/70 (1.4)	1/70 (1.4)	
Hu 2006 ⁹²	Deep-vein thrombosis	2/322 (0.6)	0/358		
Krambeck 2008 ¹⁰⁸	Deep-vein thrombosis	1/248 (0.4)		6/492 (1.2)	
Lama 2009 ¹³³	Deep-vein thrombosis		0/56	1/59 (1.7)	
Nadler 2010 ¹¹²	Deep-vein thrombosis	0/50		1/50 (2.0)	
Salomon 2002 ¹⁴⁰	Deep-vein thrombosis		1/155 (0.6)	2/151 (1.3)	
Tewari 2003 ¹¹⁶	Deep-vein thrombosis	1/200 (0.5)		1/100 (1.0)	
Pulmonary embolism					
Carlsson 2010 ¹⁰⁴	Pulmonary embolism	2/1253 (0.2)		5/485 (1.0)	
Dahl 2009 ¹²⁶	Pulmonary embolism		1/104 (1.0)	0/102	
Krambeck 2008 ¹⁰⁸	Pulmonary embolism	0/248		5/492 (1.0)	
Rozet 2007 ⁹⁶	Pulmonary embolism	0/133	1/133 (0.8)		
Salomon 2002 ¹⁴⁰	Pulmonary embolism		1/155 (0.6)	1/151 (0.7)	
Blood loss (ml)					
Al-Shaiji 2010 ¹²¹	Blood loss, mean, SD (range)		241.4, 167.0 (50–1200)	849.6, 646.7 (100–3500)	
Bhayani 2003 ¹²⁴	Blood loss (estimated), mean (SD)		533 (212)	1473 (768)	
Doumerc 2010 ¹⁰⁵	Blood loss estimated				Numbers of patients with mean estimated blood loss
	< 499	208/212 (98.1)		349/502 (69.5)	
	500–999	4/212 (1.9)		147/502 (29.3)	
	> 1000	0/212		6/502 (1.2)	
Drouin 2009 ¹⁰¹	Blood loss, mean, SD (range)	310.7, 205.5 (80–1800)	558, 574 (110–1100)	821.2, 582.3 (210–2200)	
Ficarra 2009 ¹⁰⁶	Blood loss (intraoperative), median	300		500	

continued

TABLE 53 Summary of outcomes: safety (perioperative) (*continued*)

Study	Outcome reported as	Robotic, n/N (%) ^a	Laparoscopic, n/N (%) ^a	Open, n/N (%) ^a	Notes
Fornara 2004 ¹²⁷	Blood loss, median		200	550	
Fracalanza 2008 ¹⁰⁷	Blood loss, median (range)	300 (200–400)		500 (250–650)	
Ghavamian 2006 ¹²⁸	Blood loss (estimated), mean (SD)		275.8 (43.1)	563.2 (54.5)	
Gosseine 2009 ⁹¹	Blood loss, mean	551	538		
Greco 2010 ¹²⁹	Blood loss, mean (range)		450 (150–750)	650 (400–900)	
Guazzoni 2006 ⁹⁰	Blood loss, mean (SD)		257.3 (177)	853.3 (485)	RCT
Hu 2006 ⁹²	Blood loss (estimated), median (range)	250 (50–1600)	200 (0–1500)		
Joseph 2007 ⁹⁴	Blood loss (estimated), mean (range)	190.0 (20–1400)	768 (100–2000)		Abstract
Jurczok 2007 ¹³¹	Blood loss (estimated), median (range)		200 (100–700)	550 (200–1900)	
Kordan 2010 ¹²⁰	Blood loss (estimated), median (range)	100 (50–200)		450 (300–600)	Secondary to Barocas 2010 ¹⁰⁴
Menon 2002 ⁹⁵	Blood loss, mean (SD)	256 (164.4)	391 (278.9)		
Miller 2007 ¹¹¹	Blood loss (estimated operative), mean	232.1	490.4		
Nadler 2010 ¹¹²	Blood loss, mean (range)	533 (200–1500)		1540 (500–5000)	
Ou 2009 ¹¹³	Blood loss, mean (SD)	314 (284)		912 (370)	
Poulakis 2007 ¹³⁷	Blood loss (estimated intraoperative), mean (SD)		Group I: 205 (81) Group II: 190 (84)	486 (185)	Groups I and II two age groups (data not combined)
Remzi 2005 ¹³⁹	Blood loss, mean (SD)		Transperitoneal: 290 (254) Extraperitoneal: 189 (140)	385 (410)	
Rocco 2009 ¹¹⁴	Blood loss, median (range)	200 (50–2000)		800 (150–5000)	
Rozet 2007 ⁹⁶	Blood loss (operative), mean (range)	609 (100–3000)	512 (70–1800)		
Schroeck 2008 ¹¹⁵	Blood loss (estimated), median (range)	150 (100–173)		800 (500–1200)	
Sundaram 2004 ⁹⁷	Blood loss (estimated), mean (range)	295 (50–500)	620 (250–2000)		Abstract
Tewari 2003 ¹¹⁶	Blood loss (estimated), mean (range)	153 (25–750)		910 (200–5000)	
Trabulsi 2008 ⁹⁸	Blood loss (estimated), median (range)	287 (50–1500)	370 (50–3200)		
Truesdale 2010 ¹¹⁷	Blood loss (estimated), mean (SD)	157.7 (105.1)		940.5 (615.0)	
Wagner 2007 ¹⁴⁶	Blood loss (estimated), mean (SD)		305 (164.2)	1331 (709.8)	
Surgical incision					
Fracalanza 2008 ¹⁰⁷	Length of surgical incision (cm), median (range)	3.5 (3–4)		15 (12–17)	

TABLE 53 Summary of outcomes: safety (perioperative) (*continued*)

Study	Outcome reported as	Robotic, n/N (%) ^a	Laparoscopic, n/N (%) ^a	Open, n/N (%) ^a	Notes
Other perioperative complications					
Anastasiadis 2003 ¹²²	Surgical complications		22/230 (9.6)	9/70 (12.9)	Including anastomotic leak, wound infection, rectal injury, temporary ileus, haematoma % complications for open reported as 13.1% in paper (9.17 patients)
Artibani 2003 ¹²³	Acute urinary retention		1	2	
	Pelvic haematoma		1	0	
	Cardiovascular complications		3	0	
	Subtotal		5/71 (7.0)	2/50 (4.0)	
Bhayani 2003 ¹²⁴	Major complications				
	Hydroureteronephrosis		1	0	
	Dislodged catheter requiring replacement		1	0	
	Bladder neck contracture requiring operative bladder neck incision		0	3	
	Subtotal		2/33 (6.0)	3/24 (12.5)	
	Minor complications:				
	Calf myositis		1	0	
	Obturator nerve palsy		1	0	
	Postoperative hydrocele		1	0	
	Epigastric artery injury		1	0	
	Inadvertent cystotomy		1	0	
	Subtotal		5/33 (15.2)	0/24	
	Overall subtotal		7/33 (21.2)	3/24 (12.5)	
	Brown 2004 ¹²⁵	Ulnar neuropathy		1/60	0/60
Rectus haematoma			1/60	0/60	
Subtotal			2/60 (1.7)	0/60	
Carlsson 2010 ¹⁰⁴	Myocardial infarction, <30 days postoperatively	1/1253 (0.1)		2/485 (0.4)	
	Surgical reintervention, <30 days postoperatively	24/1253 (1.9)		14/485 (2.9)	
Dahl 2009 ¹²⁶	Lymphocele		4	0	
	Hematuria		5	1	
	Hematoma leading to contracture		1	0	
	Fatal cardiac arrest		0	1	
	Genital femoral nerve irritation		3	0	
	Meatal stricture		1	0	
	Urinary retention		1	1	
	Seroma		1	0	
	Vasovagal syncope		1	0	
	Chronic pain in abdomen		0	1	
	Subtotal		17/104 (16.3)	4/102 (3.9)	

continued

TABLE 53 Summary of outcomes: safety (perioperative) (*continued*)

Study	Outcome reported as	Robotic, n/N (%) ^a	Laparoscopic, n/N (%) ^a	Open, n/N (%) ^a	Notes
Doumerc 2010 ¹⁰⁵	Bleeding	2/212 (0.9)		0/502	
	Severe pain	1/212 (0.5)		0/502	
	Pelvic haematoma	0/212		1/502 (0.2)	
	Subtotal	3/212 (1.4)		1/502 (0.2)	
Drouin 2009 ¹⁰¹	Retention	1	3	3	
	Postoperative bleeding	4	0	0	
	Lymphocele	0/	0	1	
	Subtotal	5/71 (7.0)	3/85 (3.5)	4/83 (4.8)	
Ficarra 2009 ¹⁰⁶	Postoperative bleeding	7		7	
	Cardiovascular complications	0		2	
	Wound dehiscence	0		1	
	Surgical re-exploration	4 (due to bleeding)		0	
	Subtotal	11/103 (10.7)		10/105 (9.5)	
Fornara 2004 ¹²⁷	Lymphocele		0/32	1/32 (3.1)	
Fracalanza 2008 ¹⁰⁷	Fever	2/35 (5.7)		4/26 (15.4)	'no other complications'
Ghavamian 2006 ¹²⁸	Clot retention		1	1	
	Lymphocele		2	2	
	Neuropraxia		1	0	
	Subtotal		4/70 (5.7)	3/70 (4.3)	
Gosseine 2009 ⁹¹	Surgical complications	5/122 (4.1)	8/125 (6.4)		
Guazzoni 2006 ⁹⁰	Fever		1	3	RCT
	Persistent lymphorrhoea		4	5	
	Acute urinary retention after removal of catheter		1	1	
	Subtotal		6/60 (10.0)	9/60 (15.0)	
Hu 2006 ⁹²	Myocardial infarction	0	0		
	Cerebrovascular accidents	0	0		
	Lymphocele	3	3		
	Urine retention	13	20		
	Urine leak	24	48		
	Clot retention	1	1		
	Intra-abdominal drain retraction	1	0		
	Acute tubular necrosis	0	1		
	Subtotal	42/322 (13.0)	73/358 (20.4)		
Joseph 2007 ⁹⁴	Urinary retention	12/754 (1.6)	48/800 (6.0)		Abstract
Jurczok 2007 ¹³¹	Rectal lesion		3/163 (1.8)	4/240 (1.6)	n/N calculated from reported percentages
	Lymphocele		5/163 (3.2)	7/240 (2.9)	
	Revision		2/163 (1.2)	6/240 (2.5)	
Kim 2007 ¹³²	Subcutaneous emphysema		4/30 (13.3)	Not reported	Conservative management

TABLE 53 Summary of outcomes: safety (perioperative) (*continued*)

Study	Outcome reported as	Robotic, n/N (%) ^a	Laparoscopic, n/N (%) ^a	Open, n/N (%) ^a	Notes
Krambeck 2008 ¹⁰⁸	Urinary retention, 1 month	8/286		7/564	
	Ureteric obstruction, 1 month	0/286		1/564	
	Haemorrhage/haematoma, 1 month	10/286		10/564	
	Renal failure, 1 month	0/286		1/564	
	Drug reaction, 1 month	2/286		7/564	
	Lymphocele, 1 year	1/248		5/492	
	Lymphoedema, 1 year	0/248		0/492	
	Myocardial infarction, 1 month	0/286		0/564	
	Respiratory failure, 1 month	2/286		3/564	
	Stroke, 1 month	3/286		3/564	
	Subtotal	26/248 (10.5)		37/492 (7.5)	
Lama 2009 ¹³³	Urinary retention		1	5	
	Urinary leakage		0	2	
	Bleeding		1	3	
	Seroma		1	0	
	Perioperative hypercapnia		0	1	
	Embolic stroke		0	1	
	Subtotal		3/56 (5.4)	12/59 (20.3)	
Martorana 2004 ¹³⁴	Uteral stretching		1	0	
	Lymphoceles		0	2	
	Subtotal		1/50 (2.0)	2/50 (4.0)	
Menon 2002 ⁹⁵	Entrapment of ureter in vesicourethral anastomotic stitch	0/40	1/40 (2.5)		
Nadler 2010 ¹¹²	Pneumonia	1		0	
	Gastric ulcer	1		0	
	Subtotal	2/50 (4.0)		0/50	
Ou 2009 ¹¹³	Intraoperative bleeding	1		0	
	Lymph leakage for 3 weeks	1		0	
	Subtotal	2/30 (6.7)		0/30	

continued

TABLE 53 Summary of outcomes: safety (perioperative) (*continued*)

Study	Outcome reported as	Robotic, n/N	Laparoscopic, n/N		Open, n/N (%) ^a	Notes
		(%) ^a	(%) ^a			
Poulakis 2007 ¹³⁷			Group I	Group II		
	Early complications (first 30 days after surgery):					Data not combined
	<i>Minor/moderate complications</i>					Major, moderate and minor complications defined
	Dehiscence/rupture of wound		0	1	7	
	Haematoma/haemorrhage		2	2	7	
	Urinary retention		0	2	1	Medical comorbidity assessed with a scoring algorithm placing patients into four groups (but not defined)
	Prolonged urinary leakage (> 2 weeks)		1	0	3	
	Lymphocele		2	2	2	
	Gastrointestinal symptoms including peritonitis and ileus		0	0	7	
	Delirium		6	0	4	
	Fever >39°C (urosepsis)		1	1	1	
	Subtotal		12/72 (16.7)	8/132 (7)	32/70 (43)	
	<i>Major complications</i>					
	Respiratory insufficiency		2	0	2	
	Cardiovascular including arrhythmias and myocardial infarction		1	1	3	
	Thrombophlebitis/pulmonary emboli/stroke		1	1	2	
	Subtotal		4/72 (5.6)	2/132 (1.5)	7/70 (10.0)	
	<i>Late complications (30 days after surgery)</i>					
	Bladder neck contraction		0	0	3	
	Wound hernia		0	1	3	
Subtotal		0/72	1/132 (0.8)	6/70 (8.6)		
Remzi 2005 ¹³⁹	Haemorrhage		1/80 (1.3)		3/41 (7.3)	
Rozet 2007 ⁹⁶	Cardiac complications	0	0			
	Postoperative bleeding	6	1			
	Retention	1	3			
	Renal insufficiency	2	0			
	Subtotal	9/133 (6.8)	4/133 (3.0)			
Salomon 2002 ¹⁴⁰	Lymphorrhoea		2		6	
	Pelvic haematoma		2		2	
	Postoperative neuropathy		0		2	
	Subtotal		4/155 (2.6)		10/151 (6.7)	
Soric 2004 ¹⁴³	Blood vessel damage		1/26 (3.8)		Not reported	
	Nerve damage		1/26 (3.8)		Not reported	
	Bladder neck sclerosis		2/26 (7.7)		Not reported	
Sundaram 2004 ⁹⁷	Transient urinary retention for 3 weeks after the catheter was removed	1/10 (10.0)	0/10			Abstract

TABLE 53 Summary of outcomes: safety (perioperative) (*continued*)

Study	Outcome reported as	Robotic, n/N (%) ^a	Laparoscopic, n/N (%) ^a	Open, n/N (%) ^a	Notes
Tewari 2003 ¹¹⁶	Lymphocele	0		2	
	Obturator neuropathy	0		2	
	Myocardial infarction	0		1	
	Postoperative bleeding/re-exploration	1		4	
	Subtotal	1/200 (0.5)		9/100 (9.0)	
Early postoperative results					
<i>Mobilisation</i>					
Fracalanza 2008 ¹⁰⁷	Mobilisation (days), mean (SD)	1 (0)		1.2 (0.4)	
Guazzoni 2006 ⁹¹	First flatus				RCT
	Day 1		21/60 (35.0)	11/60 (18.3)	
	Day 2		37/60 (61.7)	45/60 (75.0)	
	Day 3		2/60 (3.3)	4/60 (6.7)	
	Mobilisation				
	Day 1		55/60 (91.7)	49/60 (81.7)	
	Day 2		5/60 (8.3)	11/60 (18.3)	
	Day 3		–	–	
	Free ambulation				
	Day 1		14/60 (23.3)	6/60 (10.0)	
Day 2		46/60 (76.7)	54/60 (90.0)		
Day 3		–	–		
Poulakis 2007 ¹³⁷	Time to full mobilisation (days), mean (SD)		Group I: 3.7 (1.2) Group II: 3.2 (1.0)	5.1 (1.7)	Groups I and II two age groups (data not combined)
<i>Oral feeding</i>					
Fracalanza 2008 ¹⁰⁷	Resumption of oral feeding (days), mean (SD)	1 (0.3)		1.8 (0.7)	
Guazzoni 2006 ⁹⁰	Oral solid intake				RCT
	Day 1		–	–	
	Day 2		55/60 (91.7)	58/60 (96.7)	
	Day 3		5/60 (8.3)	2/60 (3.3)	
Poulakis 2007 ¹³⁷	Time to first oral intake (days), mean (SD)		Group I: 1.1 (0.5) Group II: 0.9 (0.6)	2.3 (0.9)	Groups I and II two age groups (data not combined)
Poulakis 2007 ¹³⁷	Duration of parenteral fluid administration (days), mean (SD)		Group I: 2.2 (0.9) Group II: 1.9 (0.8)	3.1 (1.2)	Groups I and II two age groups (data not combined)

a Data presented as n (%) unless indicated otherwise.