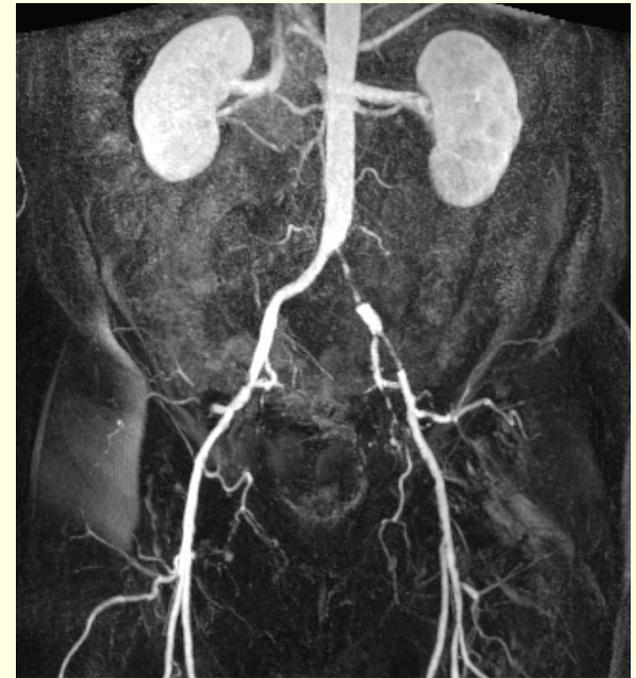
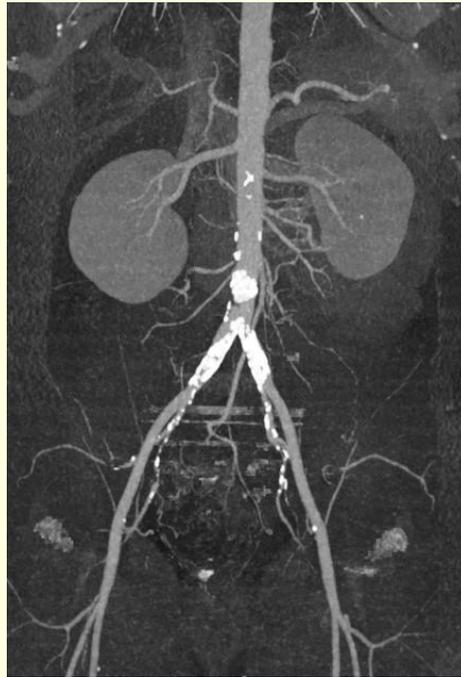
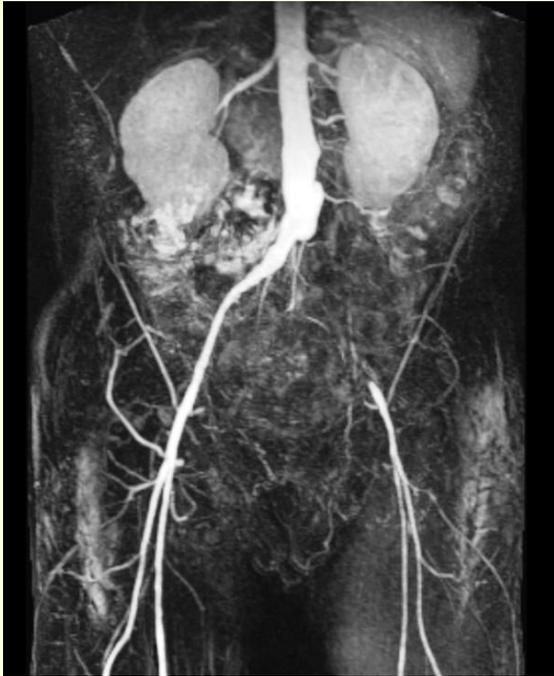


LAPAROSCOPIC AORTO-ILIAC SURGERY

J QUANIERS

UNIVERSITY HOSPITAL OF LIEGE

OCCLUSIVE AORTIC DISEASE



A new technique for laparoscopic aortobifemoral grafting in occlusive aortoiliac disease

Yves-Marie Dion, MD, MSc, FACS, FRCSC, and Carlos R. Gracia, MD, FACS,
Quebec, Canada; and San Ramon, Calif.

(J Vasc Surg 1997;26:685-92.)

Purpose : This article describes an original laparoscopic technique that allows performance of aortobifemoral bypass grafting.

Methods : The technique described is the result of 6 years of in vitro and animal experimentation. The technique consists of the creation of flap of retroperitoneal cavity. Surgery can then be conducted with no intrusion of any intraabdominal organ into the operative field.

Results : The described technique has been performed in three patients to date. the patient's intraoperative **blood loss** did not exceed 500 ml, and no complication arose. the intraoperative **need for crystalloids** was the order of 3 L (almost half the quantity usually administered). The patient's **analgesia requirement** was low in these patients, and **return to walking** was rapid. They were sent home between the fourth and sixth postoperative days.

Total laparoscopic infrarenal aortic aneurysm repair: Preliminary results

Marc Coggia, MD,^a Isabelle Javerliat, MD,^a Isabelle Di Centa, MD,^a Giovanni Colacchio, MD,^b Pierre Cerceau, MD,^a Michel Kitzis, MD,^a and Olivier A. Goëau-Brissonnière, MD, PhD,^a *Boulogne-Billancourt, France; and Viterbo, Italy*

J Vasc Surg 2004;40:448-54

Objectives : We describe our initial experience of total laparoscopic abdominal aortic aneurysm (AAA) repair.

Material and Methods : Between February 2002 and September 2003, we performed 30 total laparoscopic AAA repairs. Median aneurysm size was 51.5 mm (range, 30-79 mm) We used the **laparoscopic transperitoneal left retrocolic approach** in 27 patients, a **transperitoneal left retrorenal approach** in 3 patients.

Results : We implanted tube grafts and bifurcated grafts in 11 and 19 patients, respectively. Two minilaparotomies were performed. Median operative time is **290 minutes**. Median aortic clamping was **78 minutes**. Median blood loss was 1980 cc (rang, 300-6900 cc). In our early experience, 2 patients died of myocardial infarction. Ten major nonlethal postoperative complications were observed in 8 patients : 4 transient renal insufficiencies, 2 cases of lung atelectasis, 1 bowel obstruction, 1 spleen rupture, 1 external iliac artery dissection, and 1 iliac hematoma. Other patients had an excellent recovery with **rapid return to general diet and ambulation**. Median hospital stay was 9 days. With a median follow-up of 12 months, patients had a complete recovery and all grafts were patent.

Conclusion : These preliminary results show that total laparoscopic AAA repair is feasible and worthwhile for patients once the learning curve is overcome. However, prior training and experience in laparoscopic aortic surgery are needed to perform total laparoscopic AAA repair.

Conventional Open Aortic Surgery

- patency rate : 90% at 5 years
85% at 10 years
- mortality : < 5%
- morbidity : 8%
- large fluid shifts, prolonged ileus
- parietal incisional healing problems : 2%
- abdominal wall herniation : 20%

from Raffetto, J Vasc Surg 2003;37:1150-4

Overview of the published series of conventional open surgery for aortobifemoral occlusive disease

references	n of pts	aortic clamping time (mm)	operative time (min)	hospital stay	hospital mortality	morbidity
Nevelsteen et al, 1991	869				4.5%	20
Poulias et al, 1992	1000				3.3%	19.8
Doidovic et al, 1997	283	-	-	-	7.0%	5.2
Cron et al, 2003	720	-	-	-	2.9%	21.3
Dimick et al, 2003	3073	-	-	7.9	3.3%	-
Abelha et al, 2010	48	-	-	11	10%	-

Benefices of Laparoscopic Surgery

- no long midline incision
- less mobilisation of viscera (bowel loops)
- less body cooling and fluid loss (perspiration)
 - ➔ faster return of bowel transit
 - ➔ less parietal complications
 - ➔ less crystalloid fluid infusion requirements
 - ➔ shorter hospital stay
 - ➔ improved patient's satisfaction and well-being

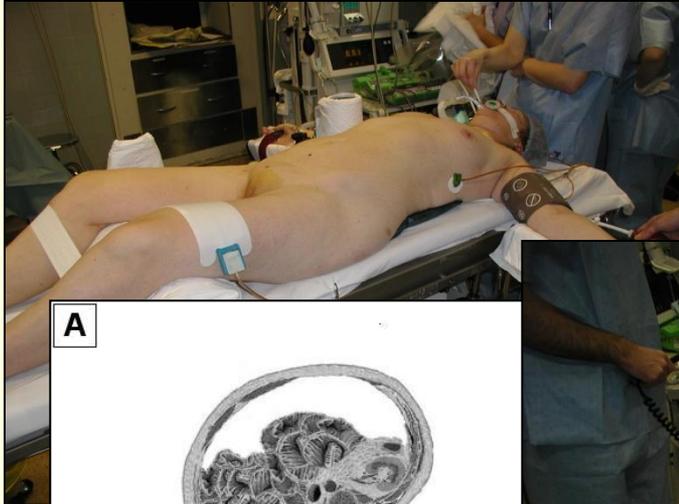
Coelioscopic advantage/disadvantage

Minimal tissue trauma
Decreased blood loss
Faster postoperative recovery
Shorter hospital stay
Shorter ICU stay
Decreased postoperative complications
Decreased postoperative pain
Learning curve
Technical challenge for anastomosis
Selected patients (aortic calcification)
Increased operative time

Technique of Coggia

- a transperitoneal access, with a left retrocolic approach in a laterally tilted patient
- left colon and small bowel “fall down” in the right hemi-abdomen
- patient positioning :
 - 45° elevation of the left flank (inflatable pillow)
 - tilting of the table to the right
(overall : the patient is tilted over 65° to the right side)
 - surgeons and nurse stand at the right (anterior) side of the patient, monitoring screen at the left (back) side

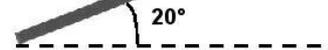
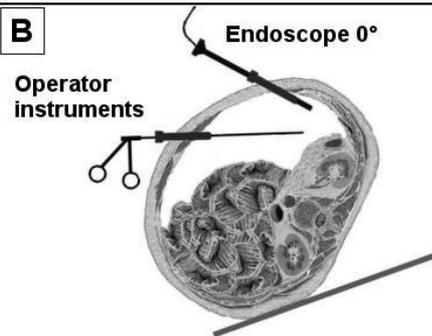
Patient Positioning

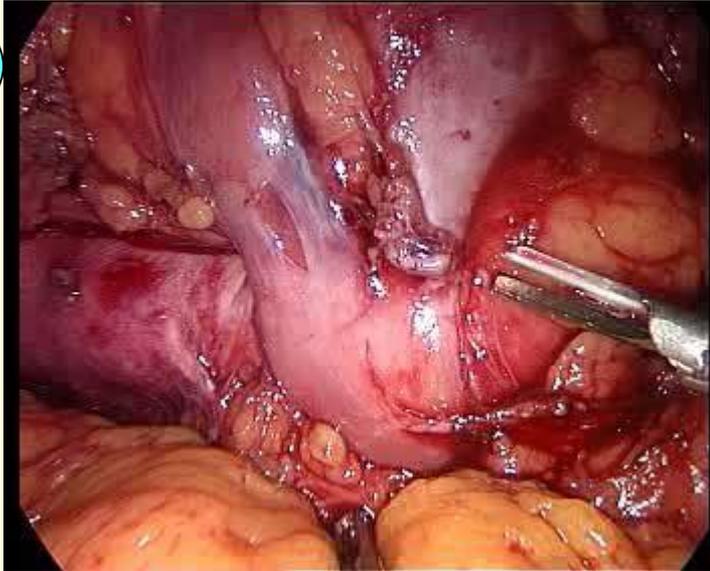
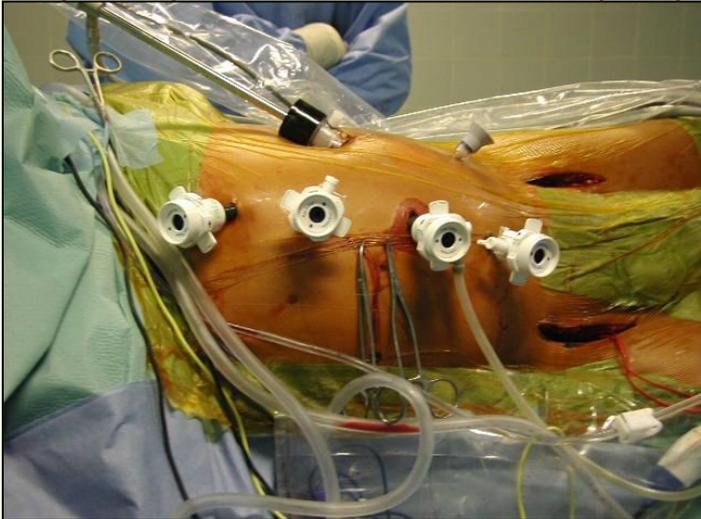
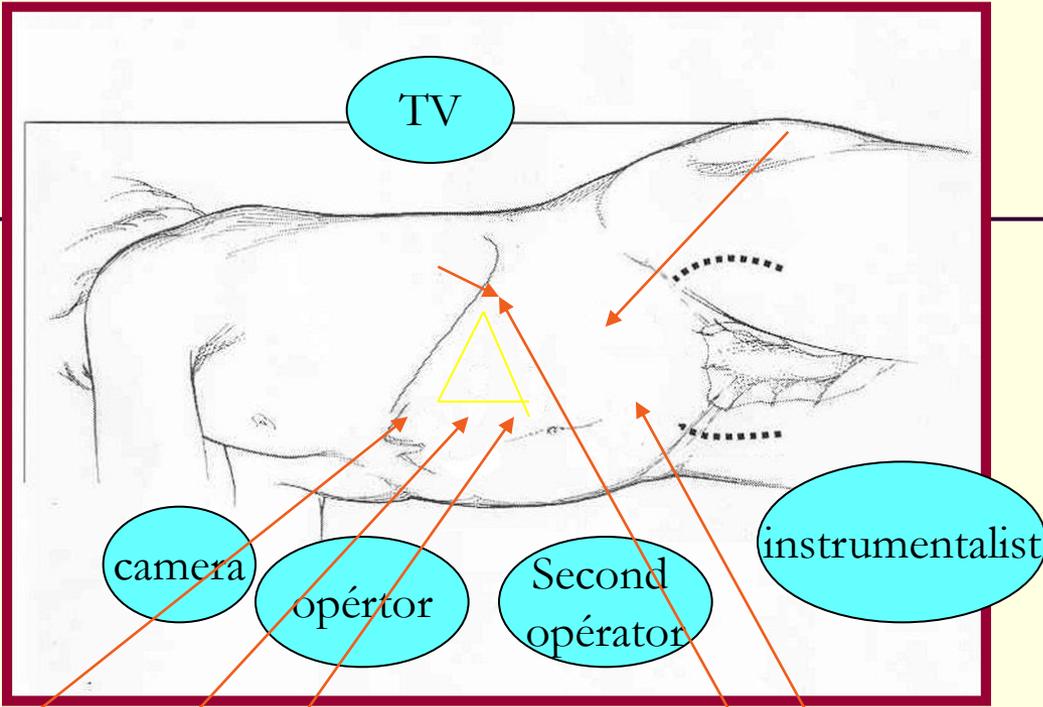


A



B





Demographic data and risk factors in 251 patients

	LABF (n=95)		OABF (n=156)		p-value student
	number	%	number	%	
gender (M/F)	60/35	63/37	100*56	64/36	0.88
mean age (years)	61	-	60.9	-	0.83
BMI	25.1	-	24.33	-	0.34
ASA class					0.41
2	75	79	112	72	
3	18	19	39	25	
4	2	2	5	3	
history of smoking	91	96	142	91	0.15
hypertension	69	73	103	66	0.67
diabetes	20	21	36	23	0.67
dyslipidemia	40	42	80	51.3	0.13
clinical stage					0.075
claudication	86	90.5	132	84.6	
ischemic rest pain	3	3	14	9	
tissue loss	2	2	11	7	
initial claudication; distance (mean)	103.5	-	126.9	-	0.41
ankle/brachial index (mean)	0.55	-	0.49	-	0.15
previous abdominal surgery	11	11.6	41	26.3	0.0039
cardiovascular-pulmonary disease	72	76	111	71.2	0.49

Operative data

	LABF (n=73)		OABF (n=156)		p-value student
	mean	range	mean	range	
operative time (min)	238	465/129	200	430/105	0.0019
aortic clamping time (min)	62	200/25	33.3	126/10	0.0001
estimated blood loss (ml)	682	1800/0	1010	4500/0	0.18
combined procedures (nb)	9		70	-	0.001
graft materials (16x8/14x7)	30/37		65/85	-	0.74
type of proximal anastomosis					0.0001
end-end	2		33	-	
end-side	69		67	-	

Postoperative recovery

	LABF (n=21)		OABF (n=73)		p-value student
	mean	range	mean	range	
ICU stay (days)	1.4	1/9	1.4	1/9	0.979
time to return to transit	1.26	0/5	2.5	1/7	0.0001
hospital stay	7	3/19	12.8	6/81	0.0001

Thirty-day postoperative mortality and complications

	LABF (n=95)		OABF (n=156)		p-value student
	number	rate	number	rate	
Mortality	0	0%	3	2%	0.17
myocardial infarction	-	-	1	-	
MOF	-	-	1	-	
CPA	-	-	1	-	
Complications					
graft limb thrombectomy	2	2.7	1	0.6%	
urinary tract infection	-	-	6	4.0%	
wound infection	-	-	2	1.3%	
renal failure	-	-	4	2.6%	
pneumonia	-	-	5	3.2%	
septicemia	-	-	4	2.5%	
pulmonary emboly	1	1.4	-	-	
ST segment elevation	-	-	1	0.6%	
compartment syndrome	2	2.7	-	-	
respiratory compromisse	-	-	6	4.0%	
mesenteric infarction	-	-	3	2.0%	
atrial fibrillation	-	-	1	0.6%	
Total	5	6.8%	40	26%	

Long-term results : n = 251

	LABF (n=73)		OABF (n=156)	
	number	rate	number	rate
mean follow-up period (months)	23.5	-	28.4	-
deceased	2	2.1	10	6.4
lost for follow-up	6	6.3	23	15
available for follow-up	87	91.6	123	78.8

Vascular events during follow-up after OABF (n = 24)

new peripheral vascular disease (n=15)	aortobifemoral bypass disease (n=9)
carotid endarterectomy : n=4	graft limb thrombectomy using Fogarty catheter : n=3
femoropopliteal bypass : n=3	femorofemoral bypass : n=2
PTCA : n=1	iliofemoral bypass : n=1
CABG : n=3	bilateral femoral pseudoaneurysm : n=1
AVR : n=1	in situ allograft replacement of infected prosthetic graft : n=1
angioplasty/stent. sup. femoral artery : n=1	axillobifemoral bypass : n=1
CFA endarterectomy : n=2	

PTCA, Percutaneous Transluminal Coronary Angioplasty ; *CABG*, Coronary Artery Bypass Grafting ;
AVR, Aortic Valve Replacement ; *CFA*, Common Femoral Artery

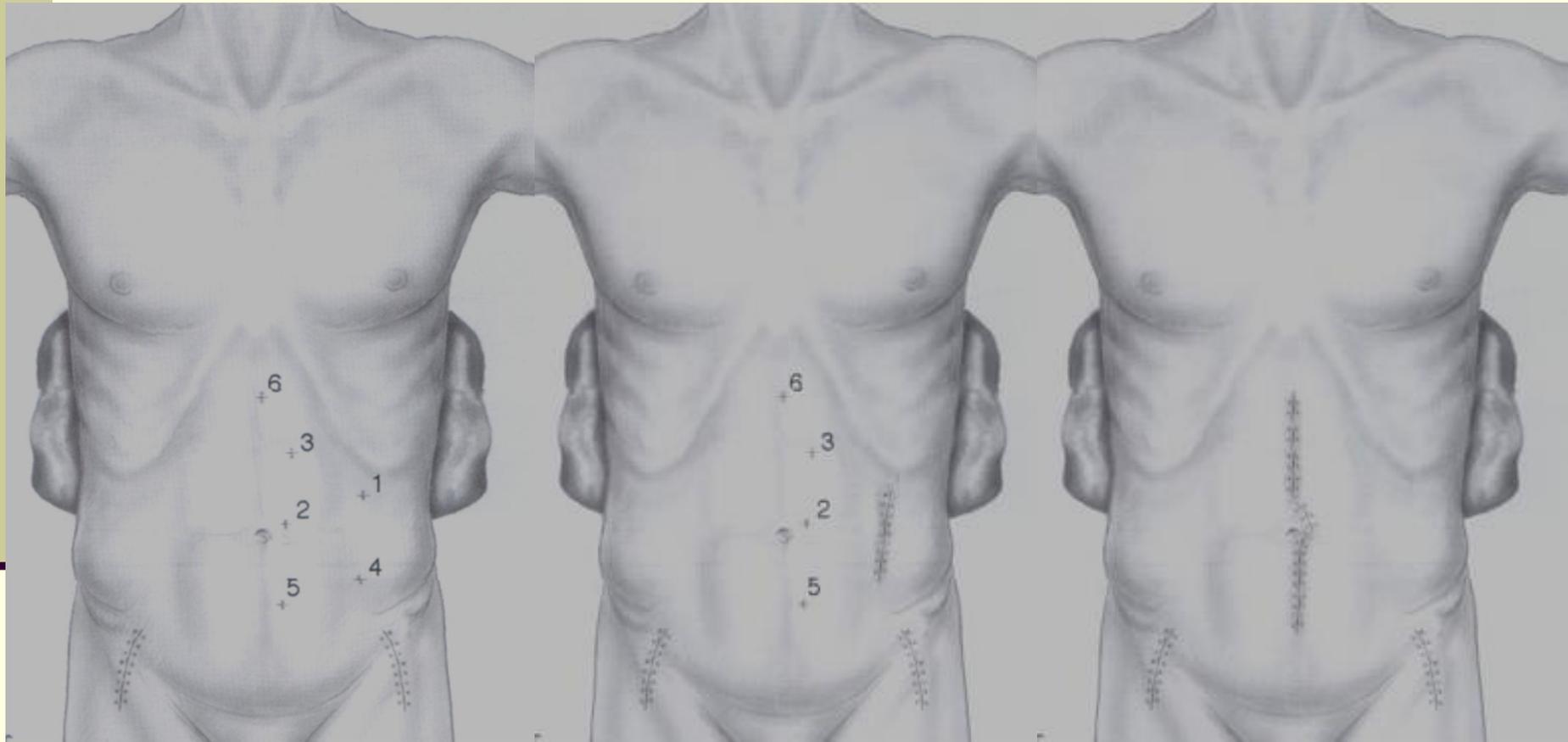
Vascular events during follow-up after LABF (n = 16)

new peripheral vascular disease (n=9)	aortobifemoral bypass disease (n=7)
carotid endarterectomy : n=2	graft limb thrombectomy using Fogarty catheter : n=3
femoropopliteal bypass : n=3	graft limb thrombectomy using Fogarty catheter + angioplasty patch : n=1
PTCA : n=1	femorofemoral bypass : n=2
popliteal pseudoaneurysm : n=1	femorofemoral bypass + angioplasty patch : n=1
CFA endarterectomy + angioplasty patch : n=1	

PTCA, Percutaneous Transluminal Coronary Angioplasty ; *CFA*, Common Femoral Artery

Overview of the published series of totally laparoscopic aortobifemoral bypass for aortobifemoral occlusive disease

references	n of pts	operative time (min)	aortic clamping (min)	blood loss (ml)	hospital stay (day)	hospital mortality	conversion		permeability/morbidity
Barbera et al, 1998	11	279	70	563	10	0%	3/11	27%	-
Said et al, 1999	7	390	59	-	6.2	14%	0		-
Alimi et al, 2001	20	350	-	-	-	6.7%	1/15	6.7%	-
Coggia et al, 2004	14	270	57	-	7.25	-	-		-
Dion et al, 2004	51	290	99	-	5	2%	5/51	10%	30%
Coggia et al, 2004	93	240	67.5	-	7	4%	2/93	2%	-
Olinde et al, 2005	22	267	89.5	690	4	4.5%	2/22	9%	22%
Lin et al, 2005	68	199	85	-	6.3	1.5%	3/68	4.4%	7.3%
Rouers et al, 2005	30	244	66	-	5	0%	6/30	2%	36.7%
Remy et al, 2005	21	240	60	500	7	0%	1/21	4.7%	24%
Dooner et al, 2006	13	390	-	-	7	0%	3/13	23%	7.7%
Cau et al, 2006	72	216	57	-	8	0%	2/72	2.8%	4.2%
Fourneau et al, 2008	50	325	69	600	4	0%	11/50	22%	16%
Di Centa et al, 2008	150	260	81	500	7	2.7%	5/150	3.4%	14.3%
Fourneau et al, 2010	139	250	59	514	5.8	2.2%	19/139	14%	16.5%



Postoperative recovery

	Conversion (n=21)		full procedure (n=73)		p-value student
	mean	range	mean	range	
ICU stay (days)	3.15	12/1	1.4	9/1	0.0001
time to return to transit	2.91	10/1	1.26	5/0	0.0001
hospital stay	11.54	19/6	7	19/3	0.0001

CONCLUSIONS

1. Safe and feasible technique
2. Patients TASC C and D
3. Less complications and better outcome
4. In our team, no laparoscopic approach for AAA disease