May 24 & 25 2012

LILLE - FRANCE

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Eric VERHOEVEN, Martin MALINA,
John BRENNAN & Richard McWILLIAMS

LIMITED SEATS

16TH INTERNATIONAL EXPERTS SYMPOSIUM

CRITICAL ISSUES

in aortic endografting 2012

www.critical-issues-congress.com

FINAL PROGRAM

FRIDAY MAY 25

8.00 Welcoming coffee

8.15 ABDOMINAL AORTA
Chairmen: *M. Malina, T. Reix*

Endovascular repair of aortic aneurysms under local anaesthesia

Mario Lachat,
on behalf of Vascular Specialists @ UHZ

LA-EVAR, 1999

Eur J Vasc Endovasc Surg 17, 170–172 (1999)
Article No. ejvs.1998.0747

ENDOVASCULAR AND SURGICAL TECHNIQUES

Temporary Surgical Arterial Closure Technique with Tourniquet Allows Transfemoral Endovascular Repair of Aortic Aneurysm in Local Anaesthesia

M. Lachat*, T. Pfammatter†, U. Moehrlen, A. Künzli and M. Turina

Department of Cardiovascular Surgery and †Institute of Diagnostic Radiology, University Hospital Zurich, Switzerland

Introduction

Since the introduction of the endovascular repair of abdominal aortic aneurysms the technique has become popular but the long-term effectiveness is unknown.[1,2] More than half of patients with an infrarenal aortic aneurysm can be treated by endovascular techniques.[3] Transfemoral endovascular aortic aneurysm repair currently requires at least one femoral arteriotomy. This procedure is usually performed under general anaesthesia probably because of the long clamping time necessary for placement and fixation

LA-EVAR, n=10

endovascular repair of

in 17 patients; in nine

th the new technique

thesis, therefore enabling the procedure to be performed under local anaesthesia.

Technique

Under local anaesthesia (lidocain 0.5-1%, 5 mg/kg of body weight, without adrenaline) the right femoral artery is exposed through a vertical incision below the inguinal ligament. The artery is secured proximally and distally with tourniquets and a transverse incision is performed above the femoral bifurcation. The endovascular delivery system is introduced into the aorta, the graft is deployed and the delivery system removed. The arteriotomy is temporarily controlled with two running sutures, beginning at each end of arteriotomy and secured in the midline with a tourniquet (Fig. 1). Blood flow through the femoral artery is allowed to resume, and only the guidewire remains in place. For a bifurcated prosthesis the introduction of the contralateral leg of the prosthesis is performed simultaneously from the other femoral artery. The suture line is completed at the end of the procedure.

including 15 bifurcated and two straight endovascular Vanguard® prosthesis (one with standard and one with new technique). The first seven patients were treated under general anaesthesia and the others under local anaesthesia. Surgical access was on the right femoral artery in 16 patients and the left one in one. There was no delivery problem. With the new technique, the clamping time of femoral artery was reduced from 66 ± 14 min using the old technique to 21 ± 5 min.[4] Mean intervention time was 120 ± 30 min (n = 17) and there was no difference between both groups; 8/10 patients operated under local anaesthesia were sent to the regular station after short observation time (2 h) on the intermediate care station. Only 2/10 were sent

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Feasibility of endovascular repair of abdominal aortic aneurysms with local anesthesia with intravenous sedation

John P. Henretta, MD, Kim J. Hodgson, MD, Mark A. Mattos, MD, Laura A. Karch, MD, Scott N. Hurlbert, MD, Yaron Sternbach, MD, Don E. Ramsey, MD, and David S. Sumner, MD, *Springfield, Ill*

Purpose: Local anesthesia has been shown to reduce cardiopulmonary mortality and morbidity rates in patients who undergo selected peripheral vascular procedures. The efforts to treat abdominal aortic aneurysms (AAAs) with endovascular techniques have largely been driven by the desire to reduce the mortality and morbidity rates as compared with those associated with open aneurysm repair. Early results have indicated a modest degree of success in this goal. The purpose of this study was to investigate the feasibility of endovascular repair of AAAs with local anesthesia.

Methods: During a 14-month period, 47 patients underwent endovascular repair of infrarenal AAAs with local anesthesia that was supplemented with intravenous sedation. Anesthetic monitoring was selective on the basis of comorbidities. The patient ages ranged from 48 to 93 years (average age, 74.4 ± 9.8 years). Of the 47 patients, 55% had significant coronary artery disease, 30% had significant chronic obstructive pulmonary disease, and 13% had diabetes. The average anesthesia grade was 3.1, with 30% of the patients having an average anesthesia grade of 4. The mean aortic aneurysm diameter was 5.77 cm (range, 4.5 to 12.0 cm). All the implanted grafts were bifurcated in design.

Results: Endovascular repair of the infrarenal AAA was successful for all 47 patients. One patient required the conversion to general anesthesia to facilitate the repair of an injured external iliac artery via a retroperitoneal approach. The operative mortality rate was 0. No pa

LA-EVAR, n=47

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were ambulatory within 24 hours of graft implantation. The patients were discharged from the hospital an average of 2.13 days after the procedure, with 87% of the patients discharged less than 48 hours after the graft implantation. Furthermore, at least 30% of the patients could have been discharged on the first postoperative day except for study protocol requirements for computed tomographic scanning at 48 hours.

Conclusion: This is the first reported series that describes the use of local anesthesia for the endovascular repair of infrarenal AAAs. Our preliminary results indicate that the endovascular treatment of AAAs with local anesthesia is feasible and can be performed safely in a patient population with significant comorbidities. The significant potential advantages include decreased cardiopulmonary morbidity rates, shorter hospital stays, and lower hospital costs. A definitive evaluation of the benefits of local anesthesia will necessitate a direct comparison with other anesthetic techniques. (J Vasc Surg 1999;29:793-8.)

LA-EVAR, 1999 (LA= LA/MAC)

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Occasionally, in otherwise healthy and young patient that can colaborate and in easy straight forward anatomy, where it is expected that EVAR can be completed within 45', LA wihtout MAC may be used…

Advantages LA/MAC-EVAR

Eur J Vasc Endovasc Surg 21, 179–184 (2001)
doi:10.1053/ejvs.2000.1295, available online at http://www.idealibrary.com on IDEAL®

To Compare General, Epidural and Local Anaesthesia for Endovascular Aneurysm Repair (EVAR)

D. A. Bettex*[1], M. Lachat[2], T. Pfammatter[3], D. Schmidlin[1], M. I. Turina[2] and E. R. Schmid[1]

[1]Division of Cardiovascular Anaesthesia, Institute of Anaesthesia, University Hospital of Zurich, [2]Department of Cardiovascular Surgery, University Hospital of Zurich, and [3]Department of Radiology, University Hospital of Zurich, CH-8091 Zurich, Switzerland

Objectives: *to compare general, epidural and local anaesthesia for endovascular aneurysm repair (EVAR).*
Methods: *retrospective analysis of 91 consecutive patients (age 43 to 89 years) who underwent EVAR under local (LA, 63 patients), epidural (EDA, 8 patients) and general (GA, 20 patients) anaesthesia.*
Results: *EVAR was successfully achieved in all patients without mortality or neurological, cardiac and respiratory complications. Vasopressive support as well as median fluid balance were significantly lessened in the LA group compared to GA group (p<0.0002). Stay in the Intensive Care Unit was necessary in 17 (27%), four (50%) and 14 (70%) patients, respectively, and median hospital stay was 3, 4.5, and 5.5 days, with a statistically significant difference between LA and GA group (p<0.0005).*
Conclusion: *LA is a safe anaesthetic method for the endovascular repair of infrarenal abdominal aneurysm, offering several advantages: simplicity, stable haemodynamics, and reduced consumption of ICU and hospital beds.*

Key Words: Aortic aneurysm; Endovascular graft; Local anaesthesia.

Local anesthesia for endovascular abdominal aortic aneurysm repair

E. L. G. Verhoeven, MD,[a] C. S. Cinà, MD, FRCSC, MSc (HRM),[a] I. F. J. Tielliu, MD,[a] C. J. Zeebregts, MD, PhD,[a] T. R. Prins, MD,[b] G. B. Eindhoven, MD,[c] M. M. Span, PhD,[d] M. R. Kapma, MD,[a] and J. J. A. M. van den Dungen, MD, PhD,[a] *Groningen, The Netherlands and Hamilton, Ontario, Canada*

Objectives: **This study reports the results of a prospective continuous cohort of patients treated for endovascular aneurysm repair (EVAR) with a unified anesthetic strategy based on the use of local anesthesia (LA) in all patients, while reserving regional (RA) or general anesthesia (GA) only for those with predefined individually or surgically specific indications.**
Methods: **All patients treated by EVAR for an elective aortic abdominal aneurysm (AAA) between April 1998 and December 2003 were included. The strategy of treatment generated three cohorts of patients (LA, RA, or GA). Primary outcome included all-cause mortality, nonfatal cardiac morbidity, respiratory complications, and renal failure. Secondary outcome measures included conversion to general anesthesia, use of analgesics, and time-related outcomes (operating time, length of stay in intensive care unit and hospital, time required to resume oral intake, and time to ambulation).**
Results: **A total of 239 patients underwent EVAR: 170 LA, 31 RA, and 38 GA. Overall mortality was one patient (0.4%). LA was associated with a lower incidence of complications compared with GA ($P < .001$). In the LA group, two patients had to be converted to GA, one because of a dissection and one because of anxiety. In 13% of the patients in the LA group, additional intravenous sedation or analgesia was required. Operating time and length of stay in intensive care was shorter in the LA and RA groups than in the GA group ($P < .001$). Length of stay in hospital and time to ambulation and regular diet was shorter in the LA group compared with the RA and GA groups ($P < .001$).**
Conclusions: **A strategy based on the preferential use of LA for EVAR restricting RA or GA only to those with predefined contraindications is feasible and appears to be well tolerated. (J Vasc Surg 2005;42:402-9.)**

Eur J Vasc Endovasc Surg **21**, 179–184 (2001)
doi:10.1053/ejvs.2000.1295, available online at http://www.idealibrary.com on IDEAL®

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[1]*Division of Ca* *of Zurich,*
[2]*Department of Ca* *of Radiology,*

Objectives: *to compar* *AR).*
Methods: *retrospectiv* *under local (LA,*
63 patients), epidural (
Results: *EVAR was* *and respiratory*
complications. Vasopre *group compared*
to GA group (p<0.000 *4 (70%) patients,*
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Key Words: Aortic ane

1997-2000, 91 EVAR

-20 GA (21%)
-8 S/EDA (9%)
-63 LA/MAC (70%)

30-day mortality: 0%

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Advantages of LA in comparizon to GA

-Less fluids and vasopressive support

«stable hemodynamics»

-Less need for ICU beds

-Shorter LOS

Local anesthesia for endovascular abdominal aortic aneurysm repair

E. L. G. Verhoeven, MD,[a] C. S. Cinà, MD, FRCSC, MSc (HRM),[c] I. F. J. Tielliu, MD,[a]
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1998-2003, 239 EVAR

-38GA (16%)

-31 S/EDA (13%)

-170 LA/MAC (71%)

30-day mortality: 0.4%

Objectives: This study r...d for endovascular aneurysm repair (EVA...LA) in all patients, while reserving regiona...dually or surgically specific indications.

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Eur J Vasc Endovasc Surg (2011) 42, 467–473

Local Anaesthesia for Endovascular Repair of Infrarenal Aortic Aneurysms CME

P. Geisbüsch [a,b,*], B.T. Katzen [a], R. Machado [c], J.F. Benenati [a], C. Pena [a], A.I. Tsoukas [d]

[a] *Baptist Cardiac and Vascular Institute, Division of Vascular and Interventional Radiology, Miami, FL, USA*
[b] *Department of Vascular and Endovascular Surgery, Ruprecht-Karls University Heidelberg, Heidelberg, Germany*
[c] *Baptist Cardiac and Vascular Institute, Division of Anesthesiology, Miami, FL, USA*
[d] *Baptist Cardiac and Vascular Institute, Division of Vascular Surgery, Miami, FL, USA*

Submitted 4 March 2011; accepted 19 May 2011
Available online 20 June 2011

KEYWORDS
Local anaesthesia;
Anaesthesia;
EVAR;
Aortic aneurysm;
Stent graft;
Endograft

Abstract *Objective:* The study aimed to analyse and report the results of a 'local anaesthesia first' approach in elective endovascular aneurysm repair (EVAR) patients.
Material and methods: Between January 2007 and August 2010, a total of 217 continuous patients (187 men, median age 76 years, range 52 94 years) underwent elective EVAR using this approach, with predefined exclusion criteria for local anaesthesia (LA). A retrospective analysis regarding technical feasibility, mortality, complication and endoleak rate was performed. The results are reported as an observational study.
Results: LA was applied in 183 patients (84%), regional anaesthesia (RA) in nine patients (4%) and general anaesthesia (GA) in 25 patients (12%). Anaesthetic conversion from LA to GA was necessary in 14 patients (7.6%). Airway obstruction ($n = 4$) and persistent coughing ($n = 3$) were the most common causes for conversion to GA. Thirty-day mortality in the LA group was 2.7%, with 16/183 patients (8.7%) experiencing postoperative complications. All type I endoleaks ($n = 5$, 2.7%) occurred in patients with LA and challenging aneurysm morphologies.
Conclusions: A 'local anaesthesia first' strategy can successfully be applied in 75% of patients undergoing EVAR. The use of LA can impact imaging quality and thus precise endograft placement, which should be considered in patients with challenging aneurysm morphologies.

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[b] Depa
[c] Bapt
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2007-2010, 217 EVAR

-25GA (12%)
-9 S/EDA (4%)
-183 LA/MAC (84%)

30-day mortality: 2.7%

Eur J Vasc Endovasc Surg (2011) 42, 467–473

ELSEVIER

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Local Anaesthesia for Endovascular Repair of Infrarenal Aortic Aneurysms CME

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New techniques in endovascular surgery: challenges for the anaesthetist?

Minimally invasive techniques for vascular surgery as well as for other surgeries have been developed in order to reduce mortality, morbidity, ICU admissions, length of hospital stay and discomfort to the patient. During the past 15 years, several different kinds of endovascular aortic prosthesis (EAP) have been developed, leading to the minimally invasive surgery of the aorta or endovascular aneurysm repair (EVAR). It began with the elective management of abdominal aortic aneurysm and has now found its way to the management of diseases of the thoracic aorta, as well as acute aortic pathologies like ruptured abdominal aortic aneurysms, acute complicated aortic B-dissection and traumatic thoracic aortic rupture. Although initially done under general anaesthesia, EVAR enables the use of local and regional anaesthetic techniques, especially useful for patients with limited respiratory reserve and poor haemodynamic stability.

Minimally invasive surgical techniques have been developed in order to reduce mortality, morbidity, ICU admissions, length of hospital stay and discomfort to the patient. Vascular surgery is no exception to this rule. During the past 15 years, several types of endovas-

(overall a relative mortality reduction of 60%), as well as a reduced operative morbidity and shorter hospital stay.[3,5,23] However, comparison of open and endovascular repair should not be done without evaluating the long-term outcome of these procedures. Recent studies reported that the perioperative survival advantage with EVAR decreased after the first postoperative year.[24–27] The rates of aneurysm-related death and reintervention after EVAR have been reported to increase continually over time.[23,28,29] There is some evidence for a mortality catch-up in the long-term follow-up, partially due to a higher aneurysm-related complication rate after EVAR.[4,23] In an observational arm of the Dutch Randomised Endovascular Aneurysm Management (DREAM) study, the overall survival curves converged in the second year after randomisation.[24] A similar pattern was reported on long-term analysis of the EVAR trial, but over a time span of six years.[23] These long-term results reflect mostly an experience based on older generations of devices, probably a poor patient and/or device selection and the learning curve with this new technique.[30] In our experience with over 800 patients, reinterventions after EVAR are uncommon (about 1%/year) and mostly treated by a redo

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New techniques in endovascular surgery: challenges for the anaesthetist?

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perioperative morbidity and mortality.[36] In our institution, more than 800 elective EVAR for AAA were performed during the past 15 years. Of those, 17% were done under GA, 1.7% under RA and more than 80% received LA with sedation with an excellent patient satisfaction.

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UHZ 1997-2012:
>640 LA/MAC-EVAR

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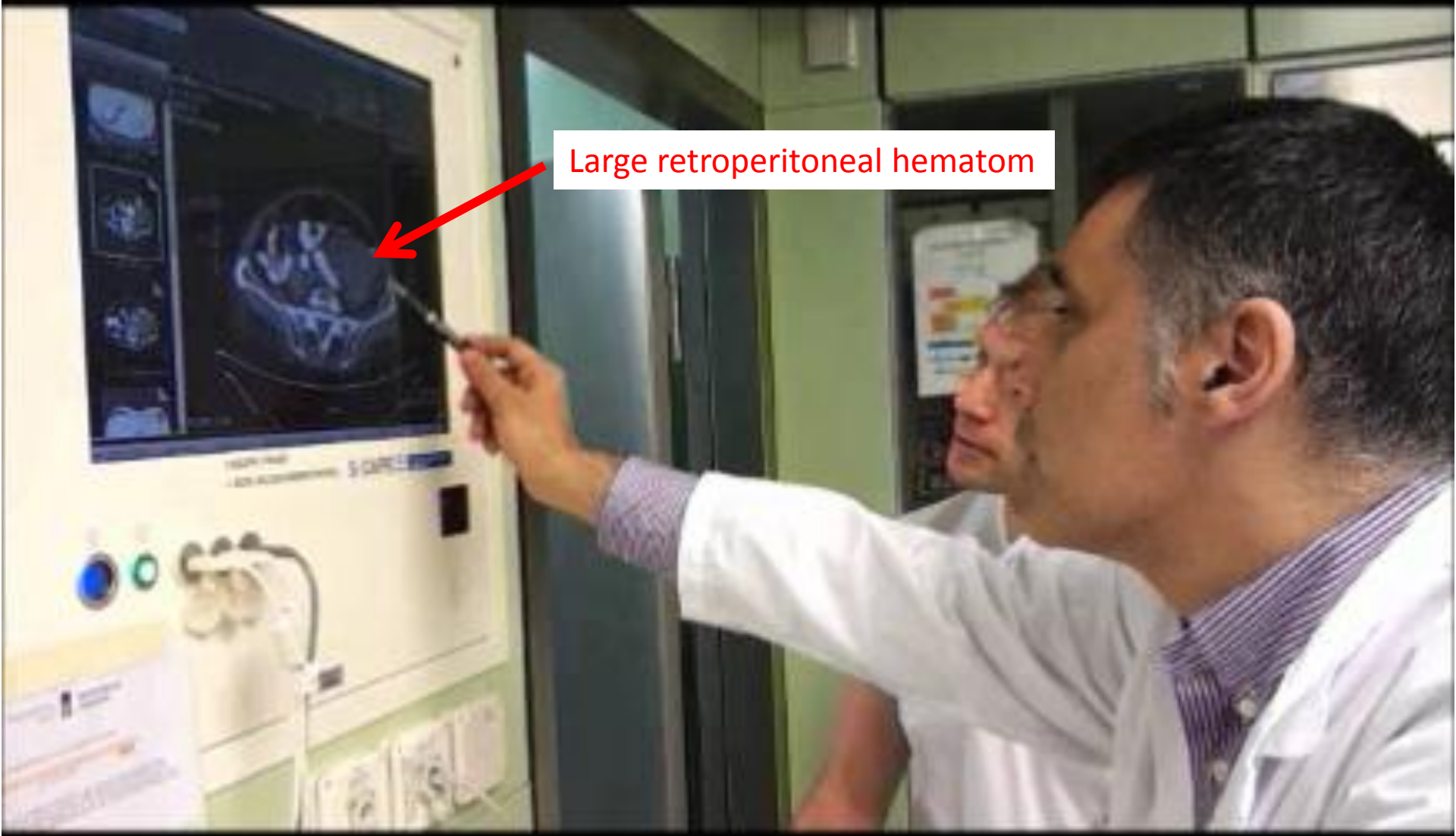
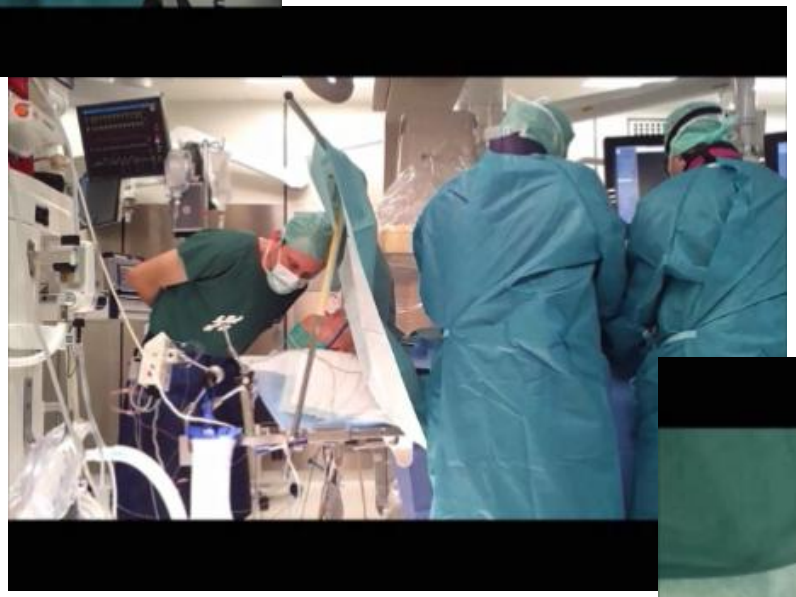
What’s about LA-rEVAR?

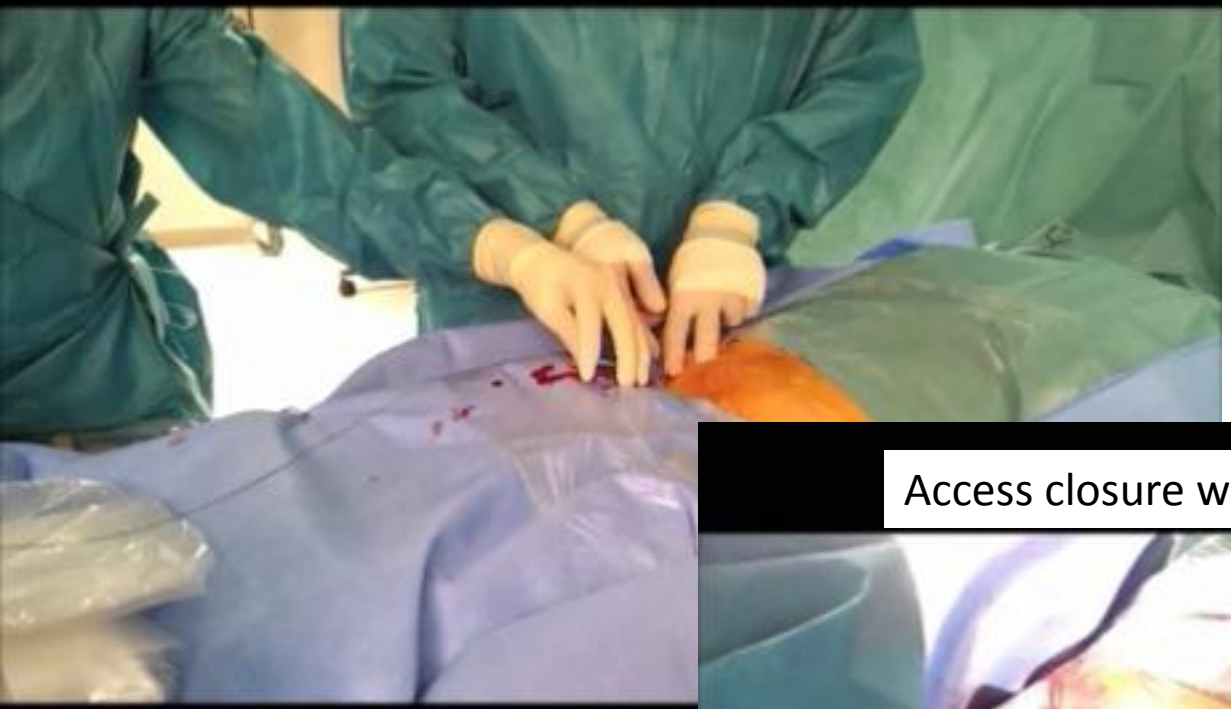
Vascular surgeon and interventional radiologist in shock room



EVAR performed with LA/MAC

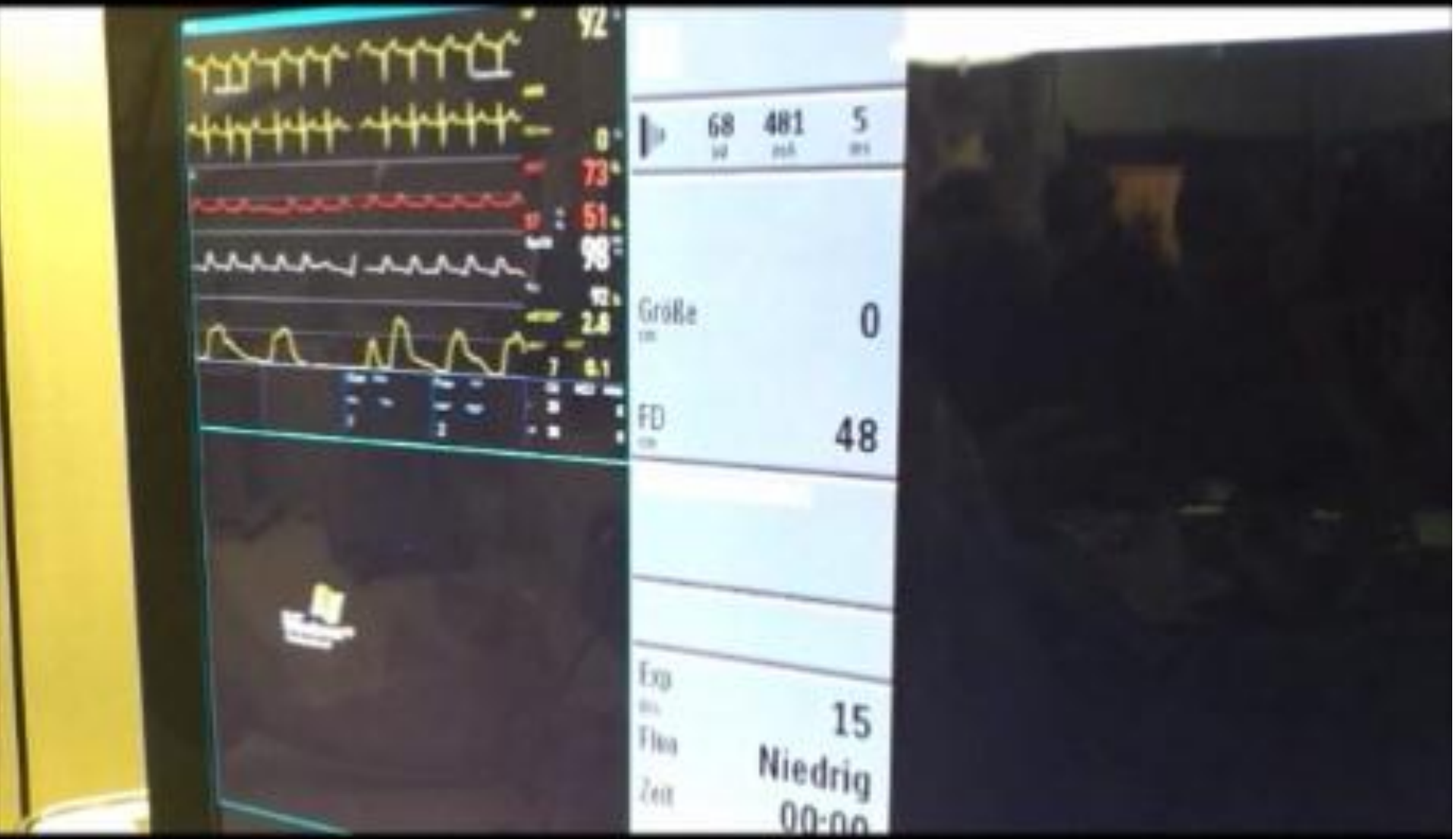


Percutaneous remote access



Access closure with Proglide system

Hemodynamics during LA/MAC-EVAR



Second postoperative day

Anesthesia for rAAA

Workshop on Management of Ruptured Aortic Aneurysm

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Type of Anesthesia:

Local Anesthesia

Pro:

preserved sympathetic tone leading to better hemodynamic stability

preserved muscle tone thereby possibly containing the bleeding

perfect neuromonitoring

Con:

uncontrolled airway

suboptimal pain control

potentially moving patient

General Anesthesia:

Pro:

controlled airway

good pain control

Con:

loosing the pros of LA

time consuming

In summary

- LA/MAC-EVAR is feasible in most cases
- LA/MAC-EVAR «probably» better than GA
  - Less disturbance of cardiopulmonary functions
  - Shorter LOS
  - Less ressources used

- **Despite of that, not universally used**
  - 20%-80%

30’ after LA/MAC-EVAR

Patient already fit for going home

30’ after LA/MAC-EVAR

Checking the dressing before discharge

EVAR algorythm UHZ (2011)

- Out-patient program
  - «Day surgery»
  - LOS< 12 hours

- Hybrid OR
  - LA/MAC-EVAR
  - Pecutaneous access

- Results (n=60)
  - 60/60 patients treated as intended
  - 1 patient discharged on the next morning
    - Access vessel dissection

EVAR should be carried out as a day procedure

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ABC
ANTWERP BLOO

AAA treatment in outpatients

introduction

- 1995 : endovascular treatment
- 1998 : bilateral percutaneous appro
- 1999 : local anesthesia
- 1999, Nov : outpatient treatment

AAA treatment in outpatients

results (Sept. 98-Jan. 2002)

OUTPATIENTS (23)	HOSPITAL (52)
• mean op. time : 100 min.	• mean op. time : 120 min.
• mortality : 0	• mortality : 0
• conversion : 0	• conversion : 1
• postop. bleeding : 0	• postop. bleeding : 1
• endoleak : 3 1 type 1, 2 type 2	• endoleak : 5 type 2
• 1 patient had to stay overnight (because Closure device problem)	• groin infection :1
	• lymfocoele : 1

Presented@CX 2002

LA/MAC @ UHZ

- Lidocain 0.5%
  - 50ml Lidocain 1%
  - 40ml NaCl
  - 10ml NaBic 8.4%
- Ultiva (Remifentanil)
  - 0.05 - 0.3ug/kg/min

Thank You!

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