

Orthopaedic And Trauma Surgery Of The Hip In Obese Patients

*Sébastien LUSTIG MD, PhD, Prof
Albert Trillat Center
Lyon - France*

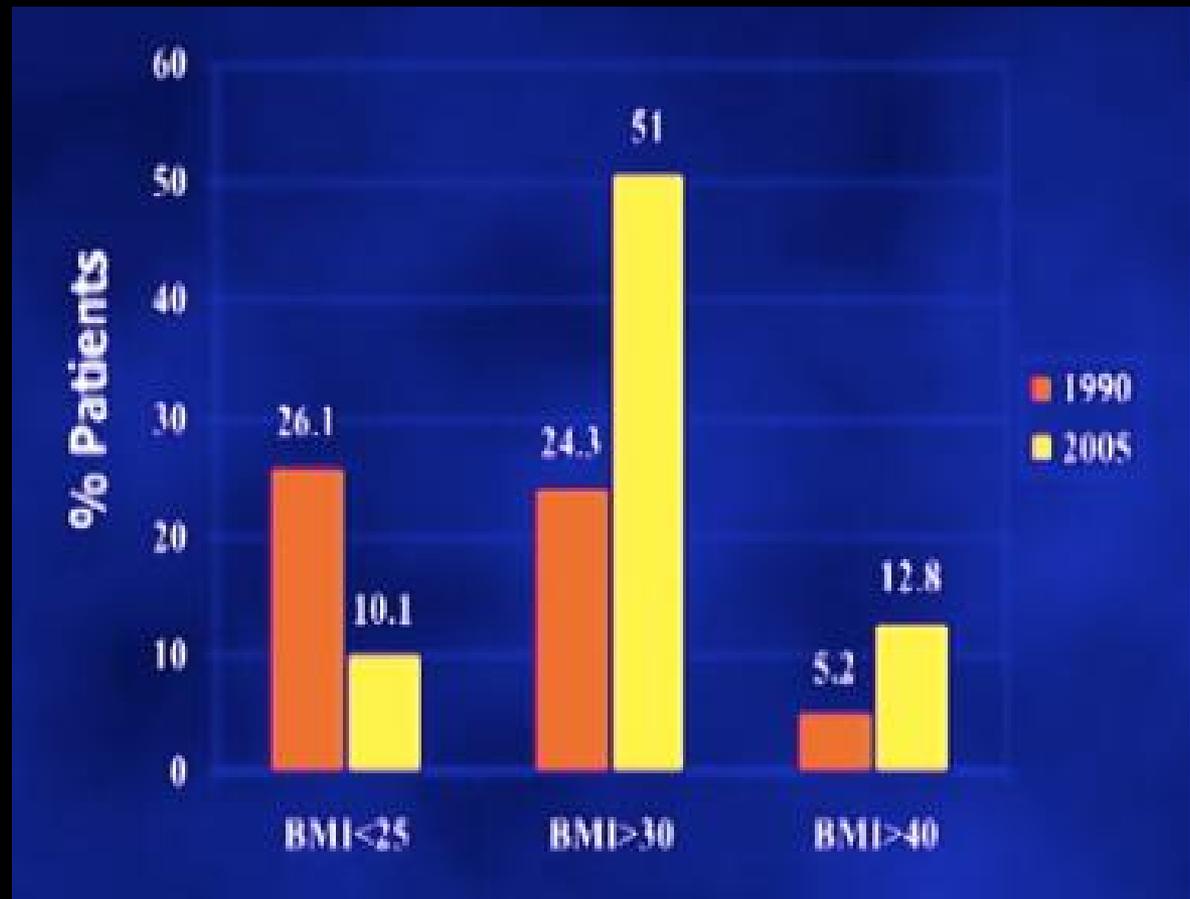


Obesity and Hip Surgery

- Osteoarthritis and Obesity
- Risk factors (if surgery)
- Surgical technique
- implant
- Results ?

Obesity in total hip arthroplasty – does it really matter? A meta-analysis

Increased % of patients undergoing THA are Obese



Correlation between obesity and osteoarthritis ?

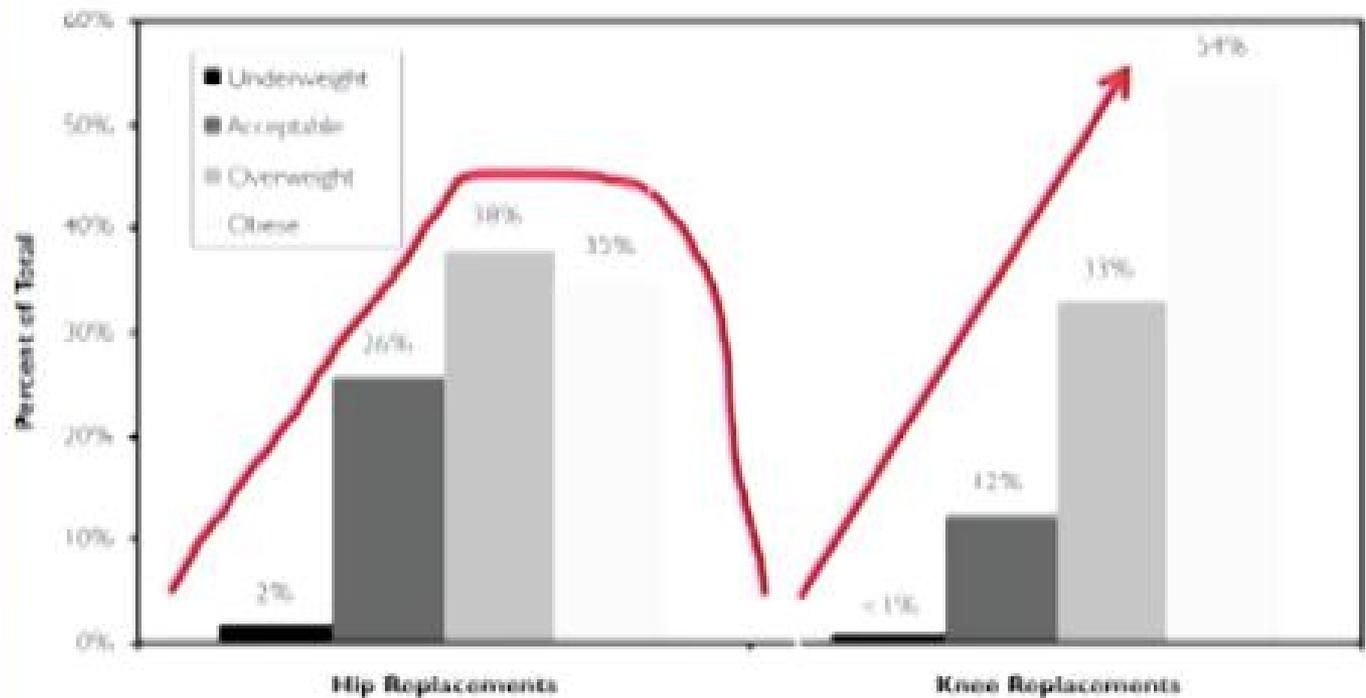


≠



Hip vs Knee OA and Obesity

FIGURE 1. Hip and knee replacement patients by body mass index (BMI) category, Canada, 2003–04

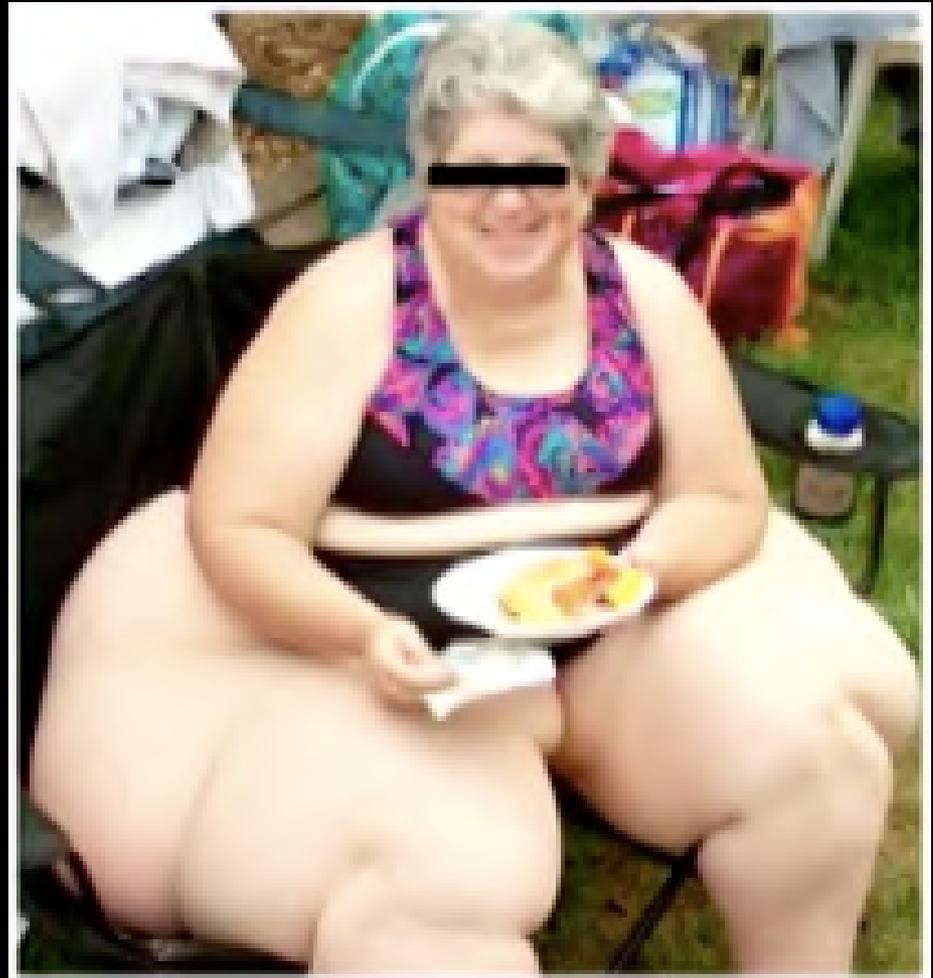


Note: Valid ICD-9 data were available for 17,244 patients.

Source: Canadian Joint Replacement Registry, CRR.

1. Osteoarthritis and Obesity

Correlation : Obesity and Hip OA ?



Correlation : Obesity and Hip OA ?

AUSTRALIA

YES

RESEARCH ARTICLE

Open Access

Obesity and increased burden of hip and knee joint disease in Australia: Results from a national survey

**Obesity → ↑ prevalence of hip arthritis
(OR = 2)**



Correlation : Obesity and Hip OA ?

CANADA

YES

Canadian Joint Replacement Registry

- BMI > 30 kg/m² → **3X risk**
- BMI > 35 kg/m² → **5X risk**
- BMI > 40 kg/m² → **9X risk**



Correlation : Obesity and Hip OA ?

NORWAY

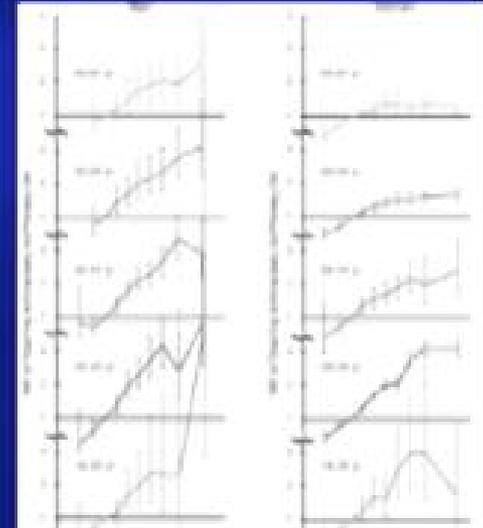
YES

The Impact of Body Mass Index on
Later Total Hip Arthroplasty for Primary Osteoarthritis

A Cohort Study in 1.2 Million Persons

Gunnar B. Flugsrud,¹ Lars Nordstøen,¹ Birgitte Espehaug,² Leif I. Haveto,²
Anders Engeland,² and Haakon E. Meyer⁴

**Obesity → increased RR of
later THA by ~2X**



Flugsrud et al. Arthritis and Rheumatism 2006

Correlation : Obesity and Hip OA ?

NETHERLAND

NO

**Obesity → increased
incidence of knee arthritis
(OR = 3.3)**

**Obesity not associated with
an increasing incidence of
hip arthritis**

Reijman et al. Ann Rheum Dis 2007



Correlation : Obesity and Hip OA ?

Moderate

Influence of obesity on the development of osteoarthritis of the hip: a systematic review

A. M. Lieveense, S. M. A. Bierma-Zeinstra, A. P. Verhagen, M. E. van Baur¹, J. A. N. Verhaar² and B. W. Koes

- **Systematic Review of 12 Studies**
- **Moderate Association Between Obesity and Hip OA**
- **Odds Ratio = 2**



COMORBIDITIES ++

Obesity = chronic progressive disease

Type 2 Diabetes:
Risk x 12.4 in female
Risk x 6.7 in male

Musculo-skeletal:
• Chronic back pain:
Risk x 2.8
• Osteoarthritis:
Risk x 2 in female
Risk x 4.2 in male



Gastro-enterology:
Gall-bladder diseases
Risk x 2.3 in female
Risk x 1.4 in male

Cardiovascular diseases:
• Hypertension
Risk > x 3
• Coronary heart disease
Risk x 3.1 in female
Risk x 1.7 in male
• Congestive heart failure
Risk x 1.8
• Pulmonary embolism:
Risk x 3.5

COMORBIDITIES ++

Obesity = chronic progressive disease

Cancer:

- Breast cancer in postmenopausal women
- Endometrial cancer
- Colon cancer

Risk x 1-2

Pulmonary:

- Sleep apnea:
Risk > x 3
- Asthma
Risk x 2-3
- Breathlessness
Risk > x 3



Gynecology, obstetrics:

- Reproductive hormone abnormalities
- Polycystic ovary syndrome
- Impaired fertility
- Fetal defects arising from maternal obesity

Risk x 1-2

Other metabolic diseases:

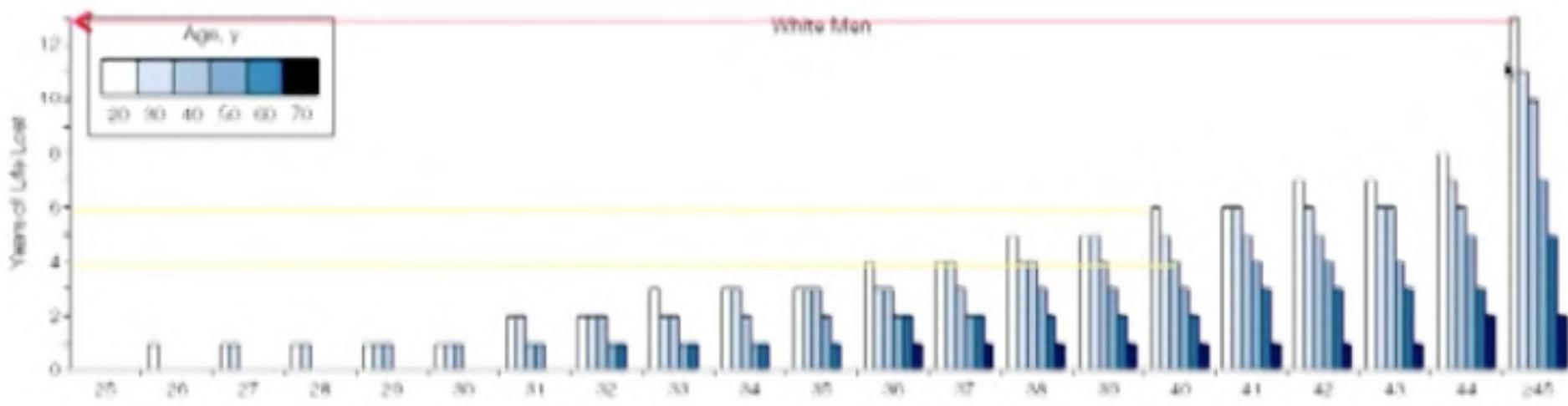
- Dyslipidaemia:
Risk > x 3
- Hyperuricaemia and gout
Risk x 2-3

Increased anesthetic risk:
Risk x 1-2

2. Risk factors

Years of life lost due to obesity

Years of Life Lost Among White Men and Women



2. Risk factors

Anesthetic

Prediction of Difficult Mask Ventilation

Table 3. Identification of Risk Factors for Difficult Mask Ventilation with Multivariate Analysis (n = 1,502)

Variables	Odds Ratio (95% CI)	P Value
Presence of beard	3.18 (1.39–7.27)	0.006
Body mass index > 26 kg/m ²	2.75 (1.64–4.62)	<0.001
Lack of teeth	2.28 (1.26–4.10)	0.006
Age > 55 yr	2.26 (1.34–3.81)	0.002
History of snoring	1.84 (1.09–3.10)	0.02

O Langeron, Anesthesiology 2000

PeerJ

Obesity increases operating room times in patients undergoing primary hip arthroplasty: a retrospective cohort analysis

Bassam Kadry¹, Christopher D. Press¹, Hassan Alesh², Isaac M. Opper³, Joe Orsini³, Igor A. Popov³, Jay B. Brodsky¹ and Alex Macario¹

Difficult Tracheal Intubation Is More Common in Obese Than in Lean Patients

Table 1. Patient Characteristics

Variable	Lean patients (n = 130)	Obese patients (n = 120)	P value
Age (yr)	42 ± 13 (18–79)	40 ± 10 (19–61)	0.62
Sex (M/F)	47/87	27/102	0.01
Height (cm)	169 ± 8 (150–184)	167 ± 9 (153–180)	0.02
Weight (kg)	66 ± 11 (44–96)	126 ± 20 (85–170)	<0.0001
BMI (kg/m ²)	23.2 ± 3.7 (15.1–30)	45.9 ± 7.1 (33.1–70.9)	<0.0001
Smoking (n)	13	46	<0.0001
Sleep apnea syndrome (n)	0	46	<0.0001
Diabetes mellitus (n)	3	18	0.005
Mallampatti class III–IV (n)	37	58	0.003
Mouth opening < 25 mm (n)	23	24	0.75
Neck movement < 80° (n)	10	20	0.04
Teeth missing (n)	15	6	0.10
Mandibular recession (n)	3	10	0.03
Back teeth (n)	19	6	0.007
Duration of preoxygenation (min)	4.0 ± 1.1 (1–10)	4.1 ± 1.2 (1–9)	0.56
SpO ₂ value after preoxygenation (%)	100 ± 1 (97–100)	100 ± 1 (96–100)	0.26
Minimal SpO ₂ value during intubation attempt (n)	99 ± 1 (91–100)	95 ± 8 (76–100)	<0.0001

P Juvin, Anesth Analg 2003

Obesity increases
duration of anesthesia
operative time
bleeding

Prevention of thromboembolism

Obesity is a *risk factor for thromboembolic events*.

The *standard recommendations* for duration of use of anticoagulants apply to these patients.

There are *no dose recommendations* for prophylaxis drugs and no study up to now has been able to identify a dose that prevents thromboembolic complications without greatly increasing the risk of haemorrhage for obese patients.

Prevention of thromboembolism

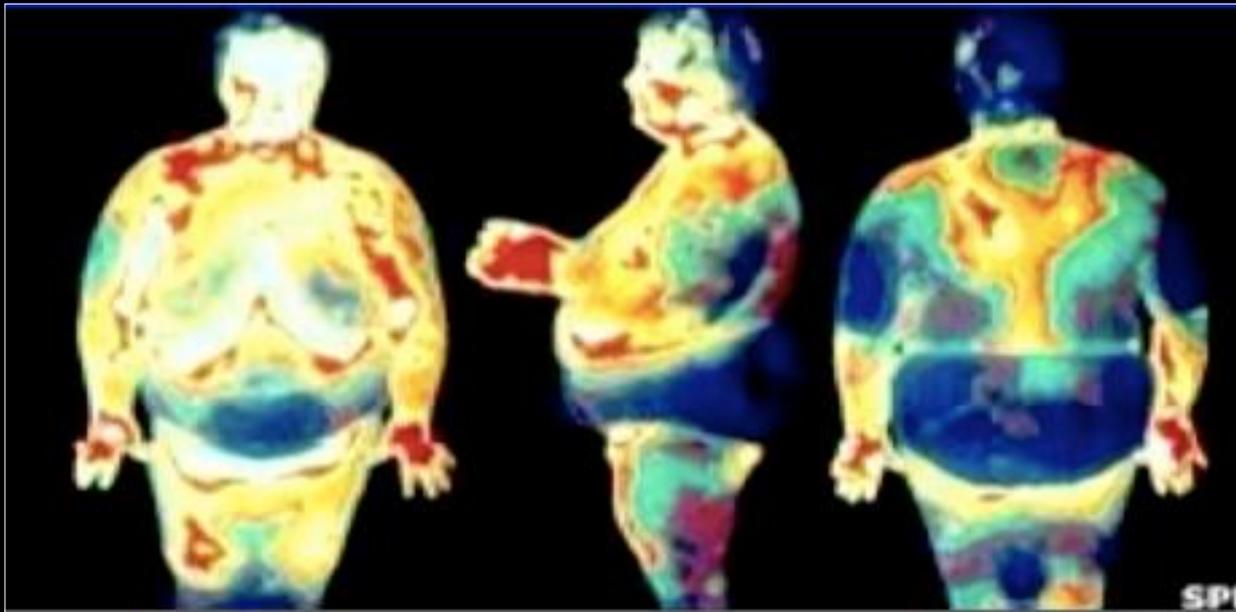
- Mechanical prophylaxis is recommended.
- Compression stockings and bandages are not well tolerated by obese patients.
- This is why plantar pump systems called *intermittent pneumatic compression devices* are heavily used in the United States, but relatively underused in Europe.



Mechanical / Biological

Real problem is biology : Fat degradation products (Leptine Adiponectine)

→ low grad inflammation status



Mechanical / Biological

Clin Orthop Relat Res (2012) 470:490–496

DOI 10.1007/s11999-011-1967-y

SYMPOSIUM: PAPERS PRESENTED AT THE ANNUAL MEETINGS OF THE HIP SOCIETY

Age and Obesity Are Risk Factors for Adverse Events After Total Hip Arthroplasty

James I. Huddleston MD, Yun Wang PhD,
Carlos Uquillas BS, James H. Hernandez MD, MBA,
William J. Maloney MD

Dislocation

Increased risk of dislocation for obese patients

Acta Orthopaedica 2008, 79 (1): 141–147

141

High body mass index is associated with increased risk of implant dislocation following primary total hip replacement

2,106 patients followed for up to 8 years

Omid Sadr Azodi¹, Johanna Adami^{1,2}, David Lindström³, Karl O Eriksson⁴,
Andreas Wladis³, and Rino Bellocco^{2,5}

Dislocation

YES

Overweight RR = 2.5 (95%CI: 1.1–5.5)

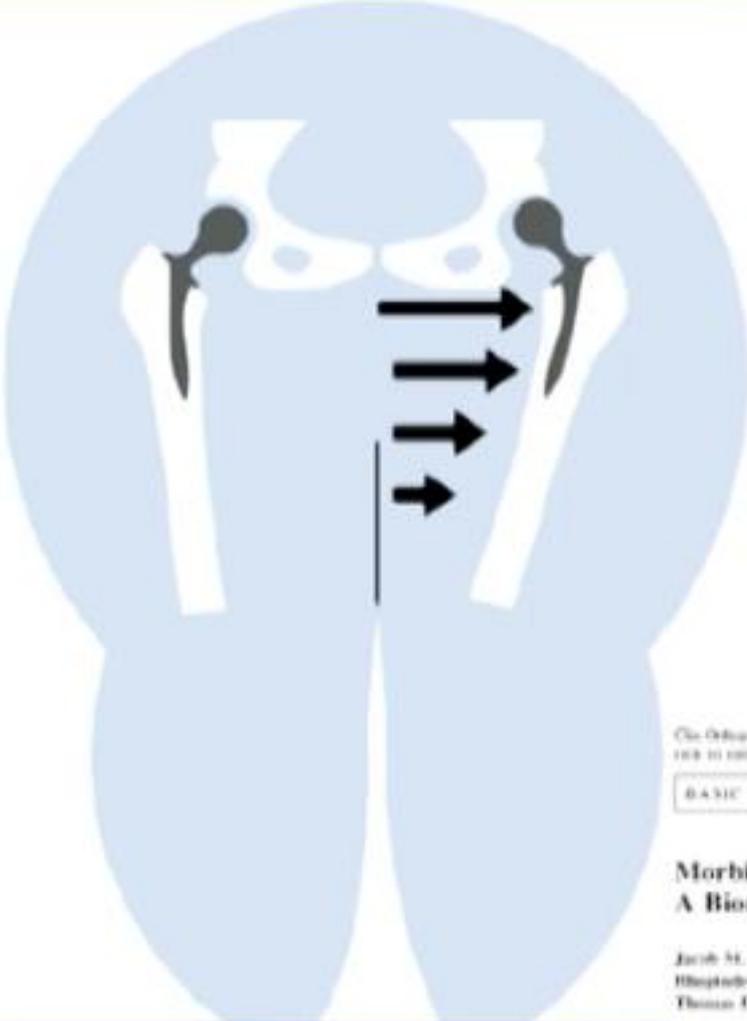
Obesity RR = 3.7 (95% CI: 1.5–9.3)

Implant malposition

Soft tissue

Thigh contact

The Problem



Clin Orthop Rel Res (2013) 471:475–489
DOI 10.1007/s11999-013-2811-1

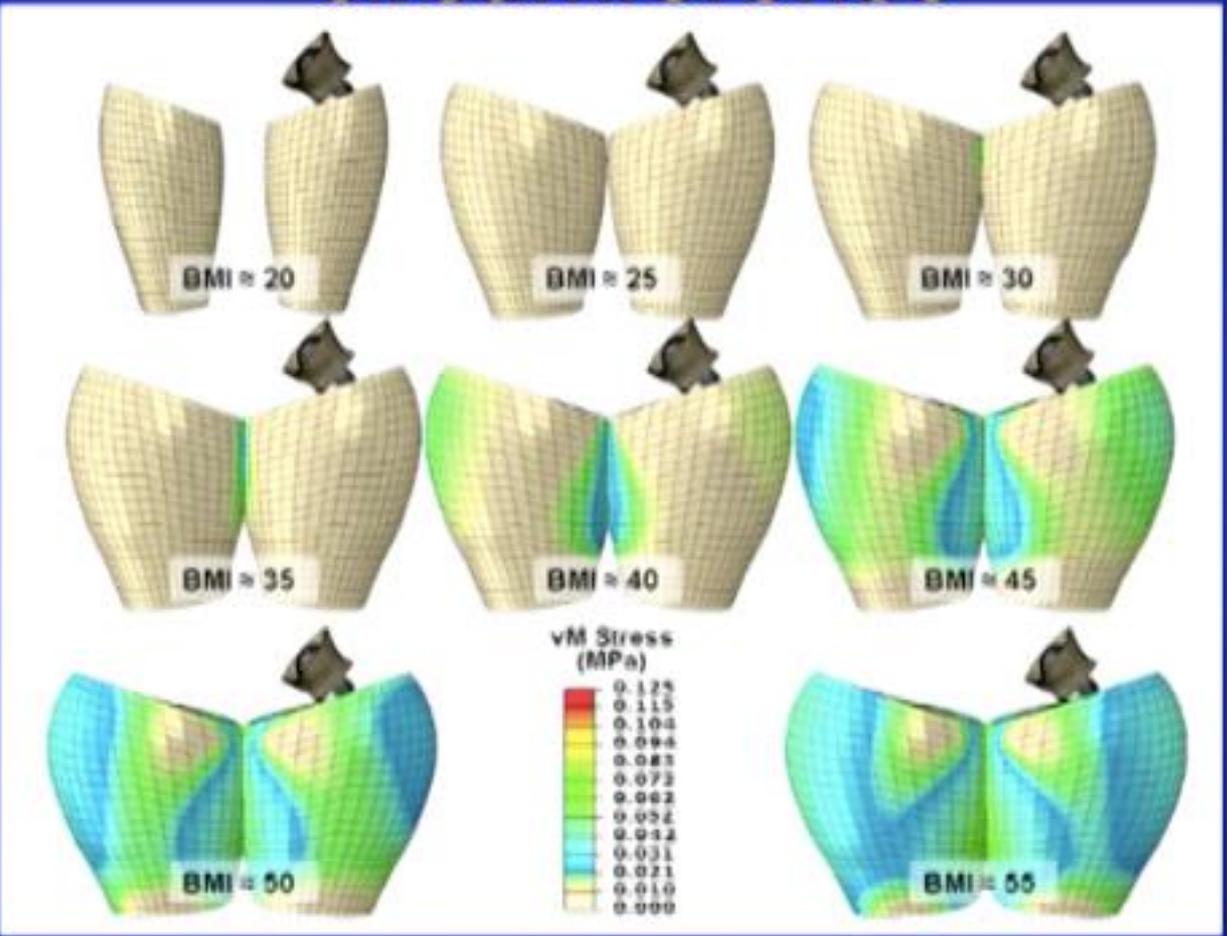
Clinical Orthopaedics
and Related Research
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BASIC RESEARCH

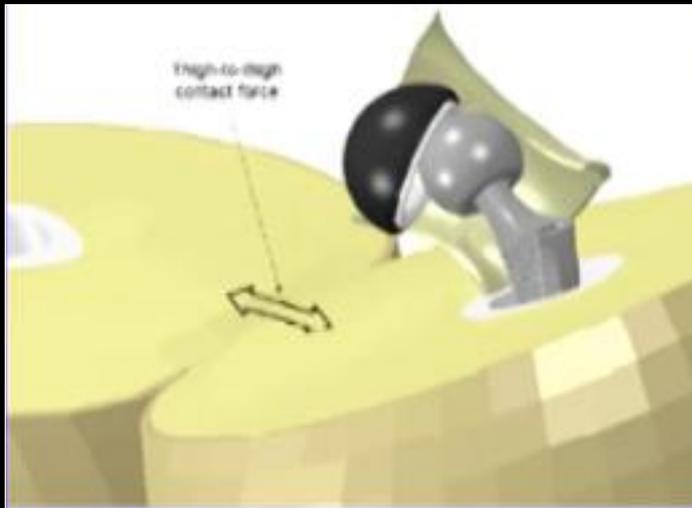
**Morbid Obesity May Increase Dislocation in Total Hip Patients:
A Biomechanical Analysis**

Jacob M. Edrins MS, Nating Daniel PhD, Douglas R. Peterson PhD,
Bhaginder Singh BS, M, John Yack PhD, John J. Callaghan MD,
Thomas D. Brown PhD

Risk related to the thigh circumference



2. Risk factors



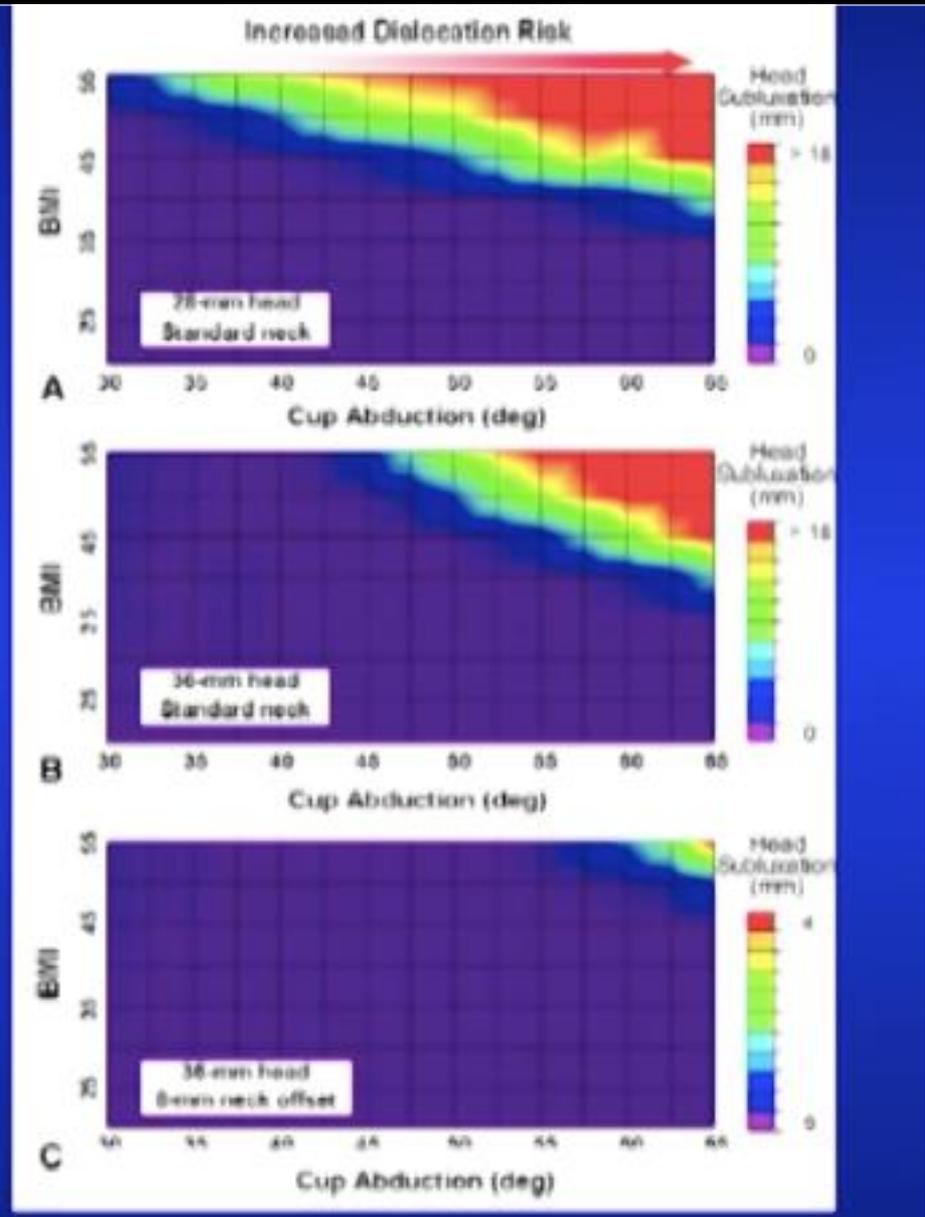
To reduce dislocation

Increased neck offset

Decreased cup abduction

Increased head size

Full hemispheric head coverage



Periprosthetic Fracture

NO

20 years data

Obesity was not a factor for PP Fracture

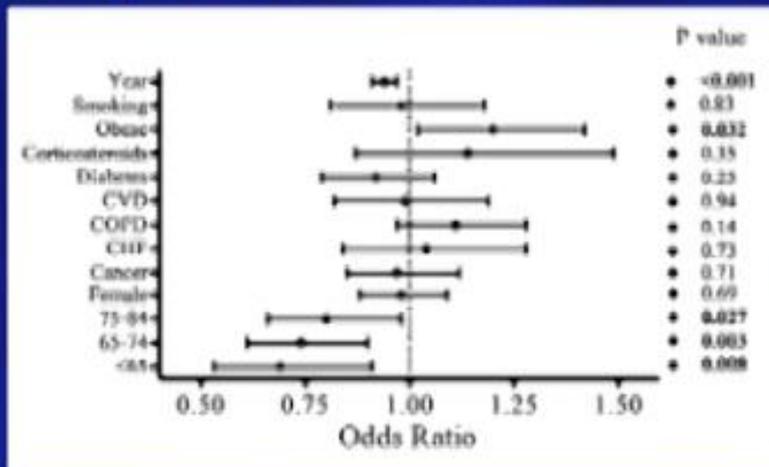
J Arthroplasty. 2013 January ; 28(1): 126–131.e2. doi:10.1016/j.arth.2012.03.010.

Are Gender, Comorbidity and Obesity Risk factors for Postoperative Periprosthetic Fractures Following Primary Total Hip Replacement?

Jasvinder A. Singh, MBBS, MPH^{1,2,3}, Matthew Jensen, MS⁴, Scott Harmsen, MS⁴, and David Lewallen, MD³

Superficial wound infection

- **Friedman et al, CORR, 2013**
 - **Obese patients → increased infections (surgical and extra-surgical sites)**
- **Huddleston et al, CORR, 2012**
 - **Obesity increases adverse events (OR = 1.20)**



Deep periprosthetic Joint Infection

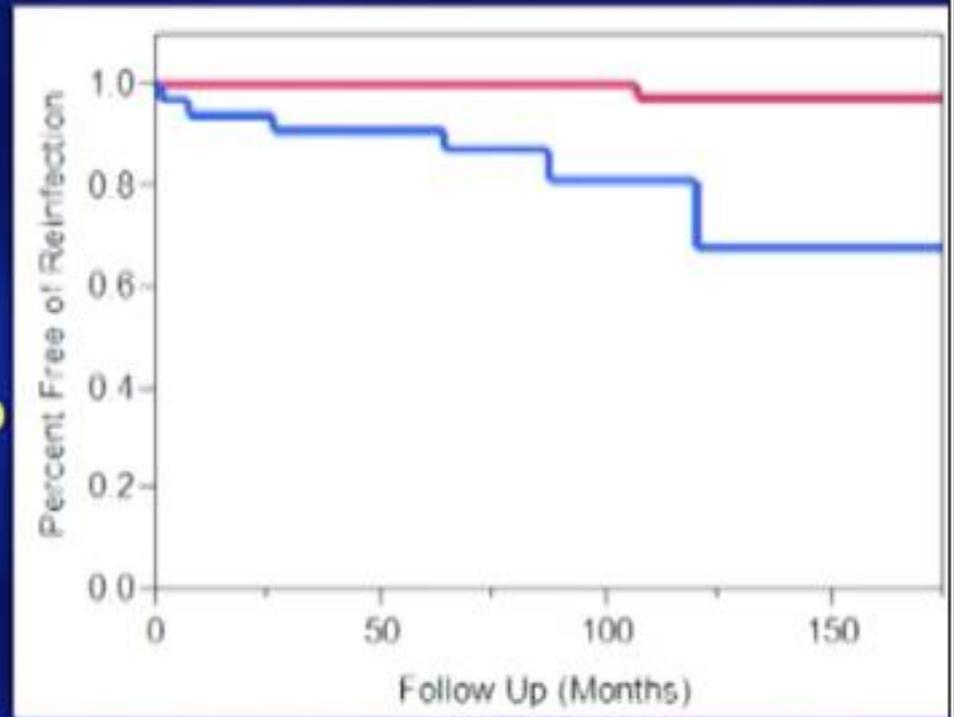
- **Dowsey et al, CORR, 2009**
 - **Morbid Obesity ($> 40 \text{ kg/m}^2$) \rightarrow Increase PJI by **9X!****
- **Malinzak et al, JOA, 2012**
 - **Super Obese ($> 50 \text{ kg/m}^2$) \rightarrow Increase PJI by **21X!****



REINFECTION

- Matt Abdel – HIP Meeting (Toulouse) 2014

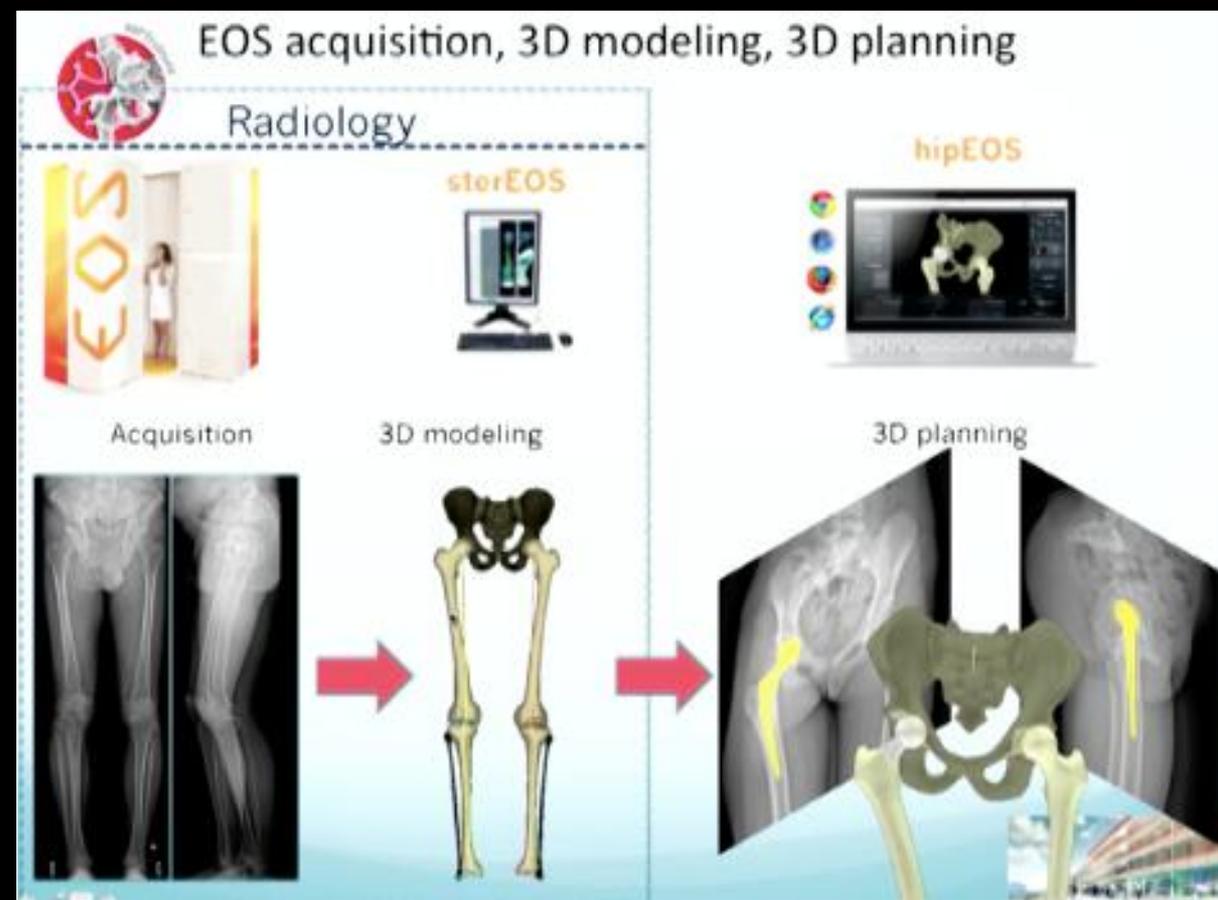
- Non-obese: 3%
- Morbidly Obese: 32%
 - $p < 0.001$
 - HR 18



Xray Assessment

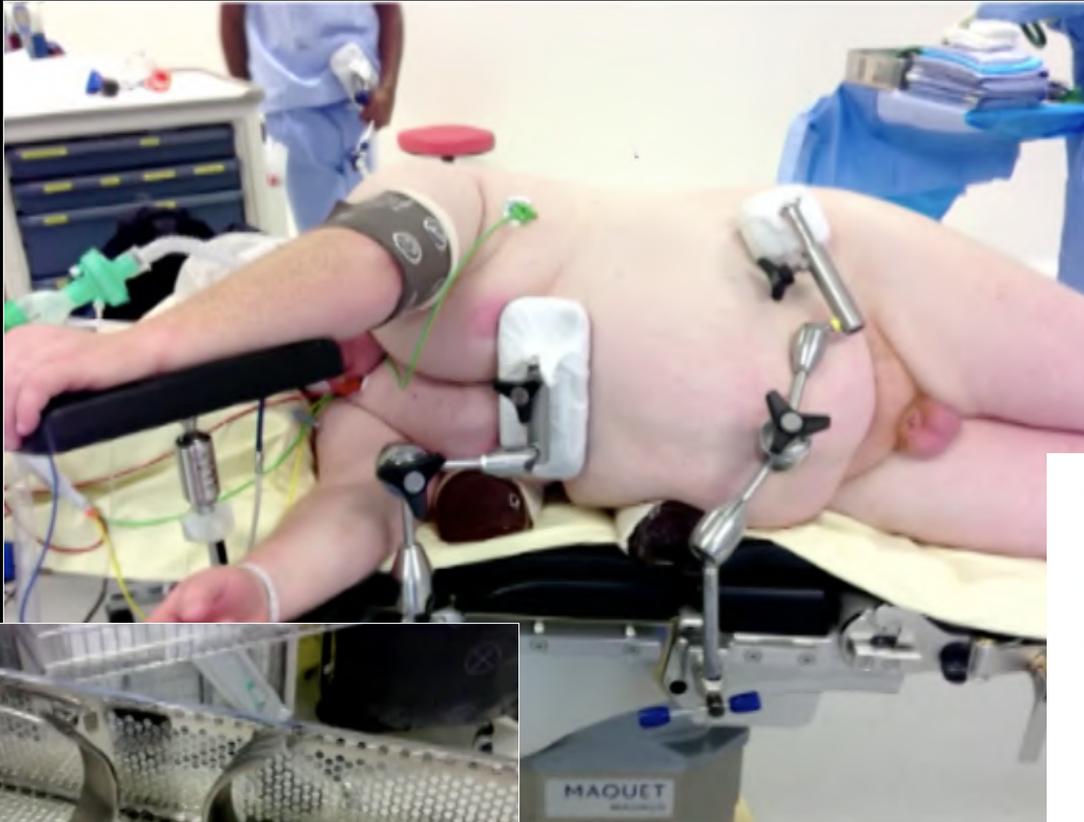


Philippe CHIRON– HIP Meeting (Toulouse) 2014



3. Surgical technique

Operating table, installation, equipment



170 to 320 kgs



3. Surgical technique

Operating table, installation, equipment

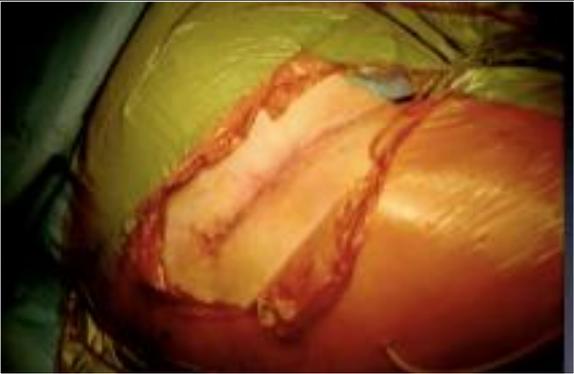
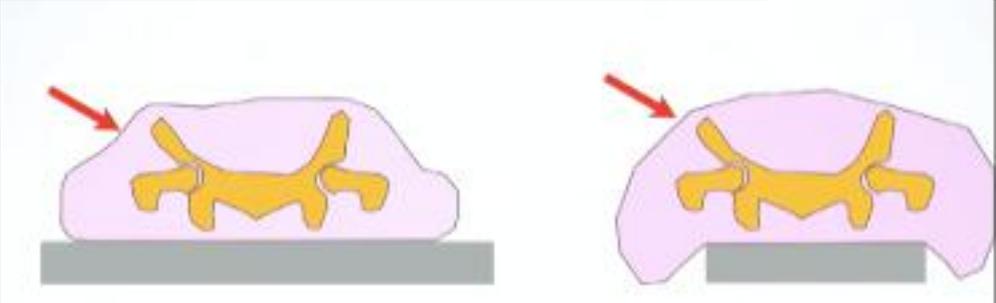
The patient must be positioned carefully. Even though the soft tissues are fairly thick, obese patients are at **risk for pressure sores and nerve compression**. When the surgical procedure allows it, lateral decubitus will make ventilation easier.



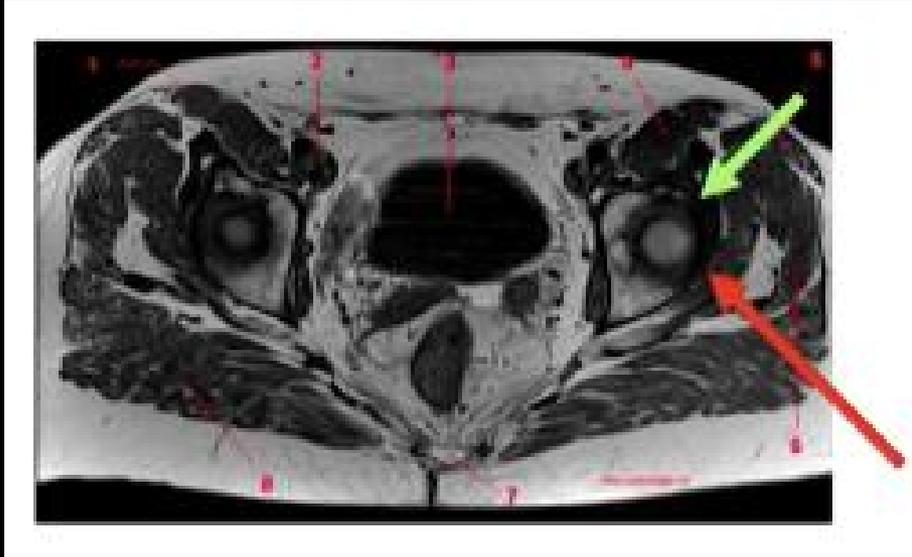
3. Surgical technique

Approach ?

- Posterior ?
- Anterior ?



« Bikini » Incision



Approach ?

- Posterior ?
- Anterior ?



The surgical approach does not influence the outcome, also long as appropriate retractors are used



« Bikini » Incision

[Severely Obese Patients Have a Higher Risk of Infection After Direct Anterior Approach Total Hip Arthroplasty.](#)

Purcell RL, Parks NL, Gargiulo JM, Hamilton WG.

J Arthroplasty. 2016 Mar 26. pii: S0883-5403(16)00326-0. doi: 10.1016/j.arth.2016.03.037. [Epub ahead of print]

[High Risk of Wound Complications Following Direct Anterior Total Hip Arthroplasty in Obese Patients.](#)

Watts CD, Houdek MT, Wagner ER, Sculco PK, Chalmers BP, Taunton MJ.

J Arthroplasty. 2015 Dec;30(12):2296-8. doi: 10.1016/j.arth.2015.06.016. Epub 2015 Jun 12.

[Increased Complications in Obese Patients Undergoing Direct Anterior Total Hip Arthroplasty.](#)

Russo MW, Macdonell JR, Paulus MC, Keller JM, Zawadsky MW.

J Arthroplasty. 2015 Aug;30(8):1384-7. doi: 10.1016/j.arth.2015.03.002. Epub 2015 Mar 17.

Incisions

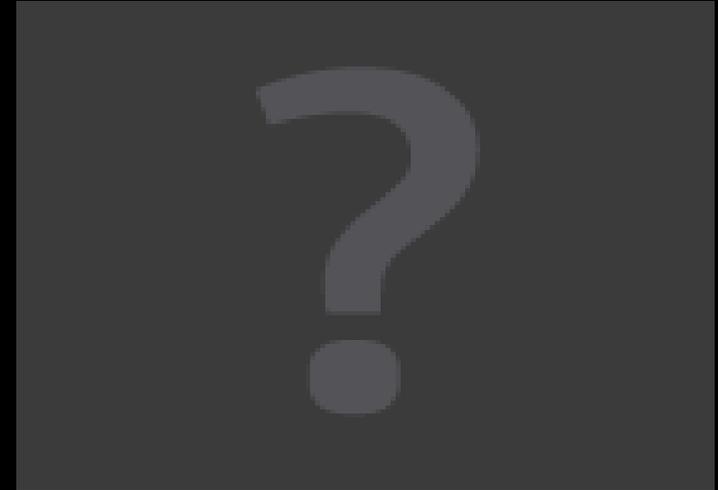
In trauma and elective surgery, the *incision size must be adapted to the BMI* to provide good exposure and minimize tension on the skin, which is quite fragile in these patients.



Implants – Cup ?



Since the *risk of instability is higher*, devices reducing the risk of dislocation must be available when elective THA is performed. (...) no data to support recommending systematic use of *dual mobility cups*, even if they are beneficial in patients at risk for dislocation(...)



Clin Orthop Relat Res. 2016 Apr 29. [Epub ahead of print]

Dual-mobility or Constrained Liners Are More Effective Than Preoperative Bariatric Surgery in Prevention of THA Dislocation.

Hernigou P¹, Trousselier M², Roubineau F², Bouthors C², Flouzat Lachaniette CH².

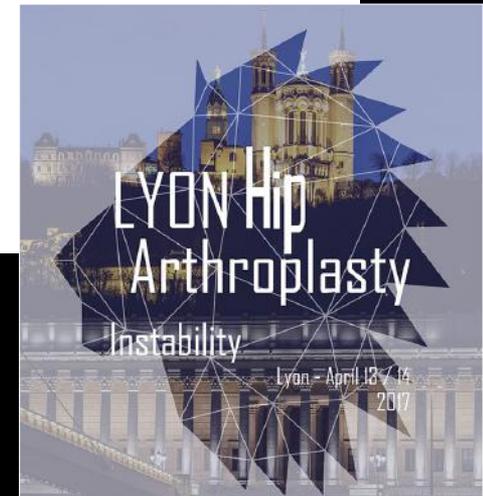
International Orthopaedics (SICOT) (2015) 39:1251–1258

DOI 10.1007/s00264-014-2612-7

ORIGINAL PAPER

Obesity is no longer a risk factor for dislocation after total hip arthroplasty with a double-mobility cup

**Paul Maisongrosse • Benoit Lepage • Etienne Cavaignac •
Régis Pailhe • Nicolas Reina • Philippe Chiron •
Jean-Michel Laffosse**



Implants - Stems ?



VS



*If cemented stem,
ATB in the cement should be
considered*



Aseptic loosening

x 4.7

[Obesity is Associated With Early Total Hip Revision for Aseptic Loosening.](#)

Electricwala AJ, Narkbunnam R, Huddleston JI 3rd, Maloney WJ, Goodman SB, Amanatullah DF.

J Arthroplasty. 2016 Mar 15. pii: S0883-5403(16)00265-5. doi: 10.1016/j.arth.2016.02.073. [Epub ahead of print]

Stanford University

Meta-Analysis

Dislocation of the hip (OR = 0.54, 95% CI: 0.38–0.75) (10 studies, n = 8,634)

Aseptic loosening (OR = 0.64, CI: 0.43–0.96) (6 studies, n = 5,137)

Infection (OR = 0.3, CI: 0.19–0.49) (10 studies n = 7,500)

Venous thromboembolism (OR = 0.56, CI: 0.32–0.98) (7 studies, n = 3,716)

Obesity in total hip arthroplasty – does it really matter?

A meta-analysis

The influence of obesity on primary total hip arthroplasty outcomes: A meta-analysis of prospective cohort studies

W. Liu, T. Wahafu, M. Cheng, T. Cheng, Y. Zhang, X. Zhang*

Department of Orthopedic Surgery, Shanghai Jiao Tong University Affiliated Sixth People's Hospital, Yishan Road 600, 200233 Shanghai, China

1999- 2013 / 15 articles / 11 271 THAs

Study	Setting	Enrolment time	Group (BMI kg/m ²)	N	Follow-up (year)
Dienstknecht et al., 2013 [16]	Germany	2010	< 30, ≥ 30	134	< 1
Raphael et al., 2013 [11]	USA	2011	< 25, 25-30, 30-39.9, ≥ 40	50	< 1
Michalka et al., 2012 [4]	Australia	2005 to 2007	< 30, 30-35, > 35	191	< 1
Davis et al., 2011 [17]	UK	1998 to 2005	< 25, 25-30, 30-34.9, ≥ 35	1617	5
Lubbeke et al., 2010 [18]	Switzerland	1996 to 2003	< 25, 25-29.9, ≥ 30	503	5 to 10
Chee et al., 2010 [13]	UK	1998 to 2003	< 30, 30-39.9, ≥ 40	110	5
Dowsey et al., 2010 [12]	Australia	2005 to 2007	< 30, 30-39.9, ≥ 40	471	1
Jackson et al., 2009 [25]	Australia	1997 to 2006	< 30, ≥ 30	1659	0 to 11
Andrew et al., 2008 [5]	UK	1999 to 2007	< 30, 30-39.9, ≥ 40	1059	5
Sadr Azodi et al., 2008 [19]	Swedish	1997 to 2004	< 25, 25-29.9, ≥ 30	2085	3
Lubbeke et al., 2007 [21]	Switzerland	1996 to 2005	< 30, ≥ 30	2495	5
Kessler et Kafer, 2007 [22]	Germany	2005	< 25, 25-29.9, ≥ 30	67	< 1
Patel and Albrizio, 2007 [20]	UK	2002 to 2005	< 25, 25-29, 30-34, > 34	550	1
McLaughlin and Lee, 2006 [23]	USA	1983 to 1987	< 25, 25-30, 30-34.9, ≥ 35	198	10 to 18
Bowditch and Villar, 1999 [24]	UK	Not mentioned	< 26, 25-30, > 30	82	< 1
Total				11,271	



The influence of obesity on primary total hip arthroplasty outcomes: A meta-analysis of prospective cohort studies

W. Liu, T. Wahafu, M. Cheng, T. Cheng, Y. Zhang, X. Zhang*

Department of Orthopedic Surgery, Shanghai Jiao Tong University Affiliated Sixth People's Hospital

1999-2012
The results suggest that obesity has a **negative influence** on the complication rate (incidence of dislocation), functional outcome and operative time of primary total hip arthroplasty.

Study	Country	Year	Obesity	n	Events
Dienst					5 to 10
Raphael					
Michalka					
Davis et al.					
Lubbeke et al.					
Chee et al., 2007 [14]			≥ 40	110	5
Dowsey et al., 2007 [15]			≥ 40	471	1
Jackson et al., 2007 [16]			< 30, ≥ 30	1659	0 to 11
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Total				11,271	



Results

J Arthroplasty. 2014 Oct;29(10):1889-98. doi: 10.1016/j.arth.2014.05.019. Epub 2014 Jun 2.

The impact of body mass index on patient reported outcome measures (PROMs) and complications following primary hip arthroplasty.

Jameson SS¹, Mason JM², Baker PN³, Elson DW⁴, Deehan DJ⁴, Reed MR⁵.

Large improvements in patient outcomes were seen irrespective of BMI, although improvements were marginally smaller and complication rates higher in obese patients.

Retrospective Study

**Overweight and obesity in hip and knee arthroplasty:
Evaluation of 6078 cases**

Daniel Guenther, Stefan Schmidl, Till O Klatte, Harald K Widhalm, Mohamed Omar, Christian Krettek,
Thorsten Gehrke, Daniel Kendoff, Carl Haasper

(...) primary hip (...) **arthroplasty can be performed in all stages of obesity with a relatively low perioperative risk.** (...) A higher BMI leads to an endoprosthetic joint replacement at earlier times (...) carried out at significantly lower levels of joint function.

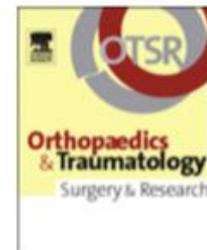
Results

Orthopaedics & Traumatology: Surgery & Research 100 (2014) S91–S97



Available online at
ScienceDirect
www.sciencedirect.com

Elsevier Masson France
EM|consulte
www.em-consulte.com/en



Review article

Obesity in orthopedics and trauma surgery

S. Parratte^{a,*}, S. Pesenti^b, J.-N. Argenson^a

^a Institut du Mouvement et de l'Appareil Locomoteur, Hôpital Sainte-Marguerite, UMR 6233, Aix-Marseille University, 270, boulevard Sainte-Marguerite, 13009 Marseille, France

^b Service de Chirurgie Pédiatrique Orthopédique, Hôpital d'Enfants de la Timone, 13009 Marseille, France



Results

THA is successful even in obese people, with almost no increase in complications (other than wound healing) and excellent functional results.

Obese patients should not be denied the opportunity to have THA solely based on their BMI.

McCaldenRW, CharronKD, MacDonaldSJ, BourneRB, NaudieDD. Does morbid obesity affect the outcome of total hip replacement? An analysis of 3290 THRs. J Bone Joint Surg Br 2011;93(3):321-5.



Review

Obesi

S. Parra

^a Institut du
13009 Mars

^b Service de



CrossMark

Take Home Message

**MILD ASSOCIATION
BETWEEN OBESITY AND
OA**



OR = 2

Take Home Message

Anesthetic risk

COMORBIDITIES +++



Take Home Message

PATIENT INFORMATION ++

Higher risk of dislocation

Higher risk of infection

Higher risk of aseptic loosening ?

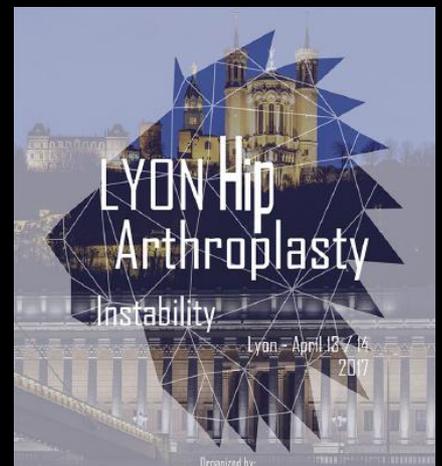


Take Home Message

PATIENT INFORMATION ++



REAL BENEFIT TO GET A THA



Thank You

sebastien.lustig@gmail.com