

Total hip replacement in young patients under 20 years of age: Survival, Revisions and Quality of Life

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Abstract

Introduction: Total hip replacement (THR) is the most effective treatment for the progressed hip arthritis. However, indication of THR for young patients is controversial because these patients might need several revisions in their lives. Revision surgery can increase complications and impair hip function. However, alleviation of hip pain and improvement of function through THR will might have substantial benefits on the development of young patients. When considering indication for THR in young patients, it is highly important to discuss the potential risks and benefits of the treatment. However, there are currently only a few reports on THR in young patients. The outcome of the revisions are unknown. *The aim of this study is to report the outcome of THR in young patients in order to provide objective data for decision-making.*

Patients and methods: We included patients who underwent THR under 20 years of age and had been reported to the Norwegian Arthroplasty Registry (NAR) during the period 1987 – 2010. The information about the following revisions was obtained up to 2012. There were 141 THRs in 111 patients. 80 patients (94 hips) were interviewed with EQ5d, SF 36, UCLA and clinically with HHS.

Results: The mean age at the 141 primary THRs was 17 years (SD: 2.1, range: 11–20). 8 patients with 9 THRs died after mean 5.3 years (SD: 3.3, range: 0.8–11.0) of the primary THR. Mean follow-up period was 13.7 years. The most common category of the underlying hip disease was pediatric diseases in 54 hips (41%). 11 hips (8%) were sequela of trauma. 7 hips (5%) were sequela of infection and 15 hips (12%) had another specified or unknown etiology. Thirty-nine hips had undergone at least one revision. The 10-year survival of the primary implant was 70%. The 5-year survival of the first 11 years (1987–1998) was 84% and that of the later 11 years (1999–2010) was 97%. The survival of the first revision as endpoint second revision was 62% at 10 years. In total, 69 revisions had been reported to NAR. The maximum number of revision performed on the same THR was 7. At the last follow-up Harris Hip Score (HHS) was 83 (15–100) and physical activity score according to UCLA was 6.5. The EQ-5D VAS was 75 with no difference between patients with or without previous revisions. SF-36 scores showed lower performance for women than for men on some parameters. Radiological examinations showed osteolysis around 19 % of the cups and 62 % of the stems. Some radiographs showed worrying signs of loosening even if HHS were high.

Conclusion: Young patients had low survival rate of primary THR. Survival decreased the more revisions performed. However, survival had improved during the recent 11 years and clinical outcome was good. We concluded that patient should be informed not only about the survival of the first revision, but also the high possibility of multiple revisions.

Background

Indication of THR for young patients is controversial because these patients might need several revisions in their lives. However, alleviation of pain and improvement of function through THR might have substantial benefits on the physical, psychological and social development of young patients. Currently there are only a few reports on THR in young patients.

Objective

The aim of this study is to report the outcome of THR in young patients in order to provide objective data for decision-making.

Patients and methods

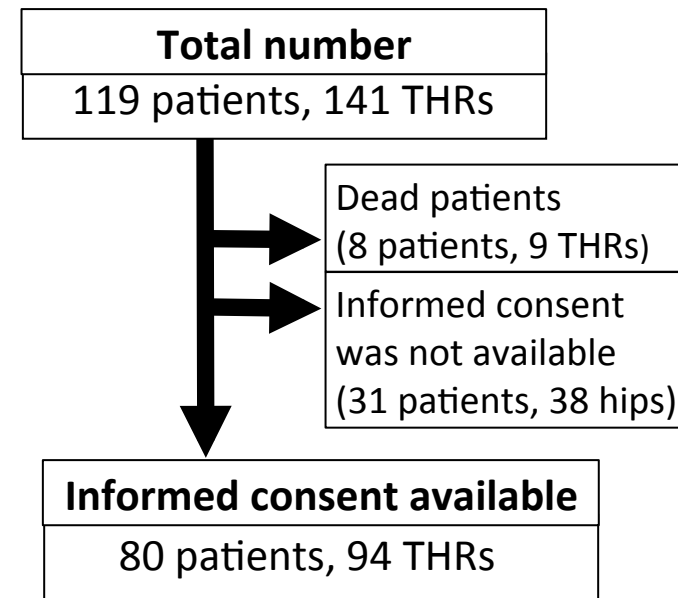
Database: Norwegian Arthroplasty Registry
Inclusion: Primary THR under 20 years of age
Period: 1987 – 2010
Follow-up: 1987 – 2013 (minimum 3 years follow-up)
Data collection: Register data (Diagnosis, implant names and revisions), radiographs, medical records, Harris Hip Score, EQ5d, SF36, UCLA activity and a interview by one of the authors (VH).

References

- 1) Pakos EE, Paschos NK, Xenakis TA. Long Term Outcomes of Total Hip Arthroplasty in Young Patients under 30. Arch Bone Jt Surg. 2014 Sep;2(3):157-62.
- 2) Wangen H, Lereim P, Holm I, Gunderson R, Reikerås O. Hip arthroplasty in patients younger than 30 years: excellent ten to 16-year follow-up results with a HA-coated stem. Int Orthop. 2008 Apr;32(2):203-8.

Results

1. Patient inclusion



2. Data collection

	Radiographs	Medical records	Direct interview
Number	86 Hips	71 Hips	70 patients
%	91%	76%	88%

3. Patient demographic

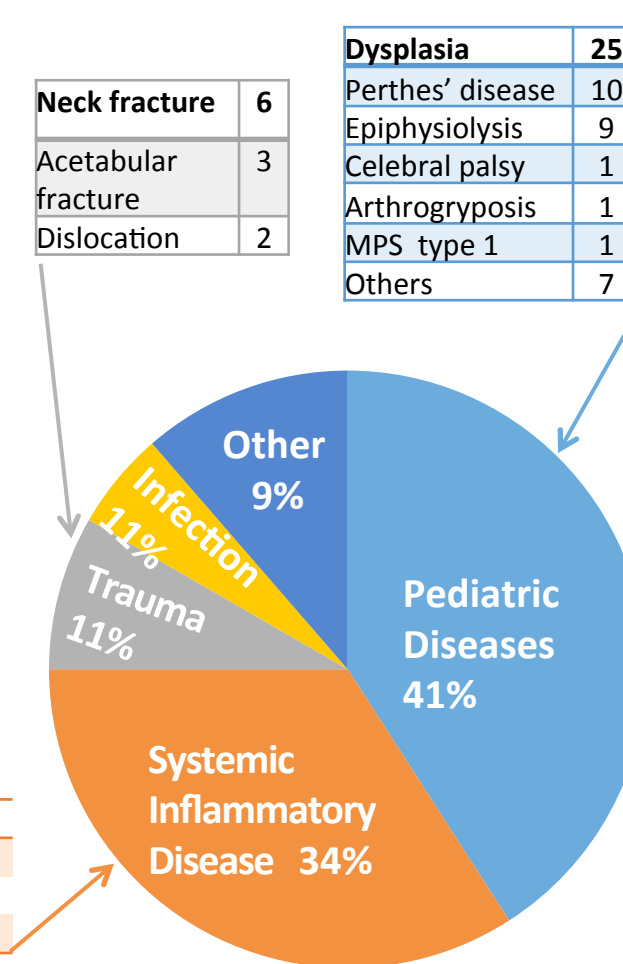
Overview

Male : Female hip (patient)	36:58 (32:48)
Age at index THR (± SD, range)	17.0 (±2.1, 11.2-19.9)
Follow-up years (± SD, range)	13.5 (±7.4, 3.1 – 26.2)

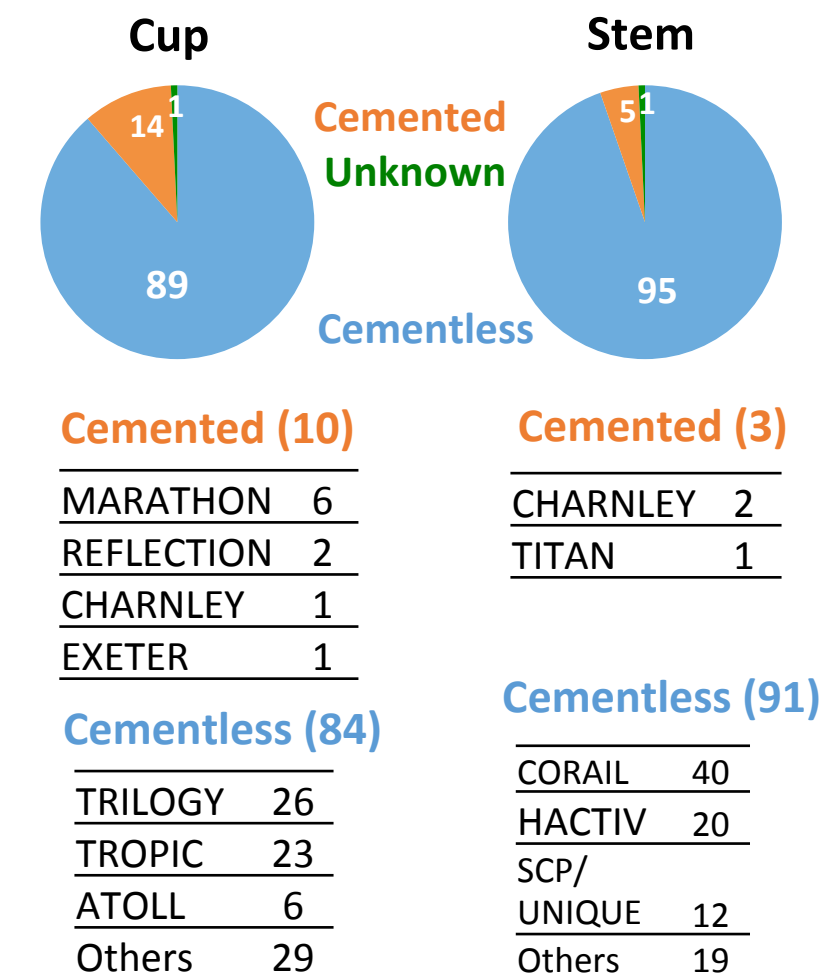
Diagnosis

Systemic inflammatory diseases	32
Pediatric diseases	31
Sequela of trauma	10
Others	21

4. Pathology (n)



5. Primary implant

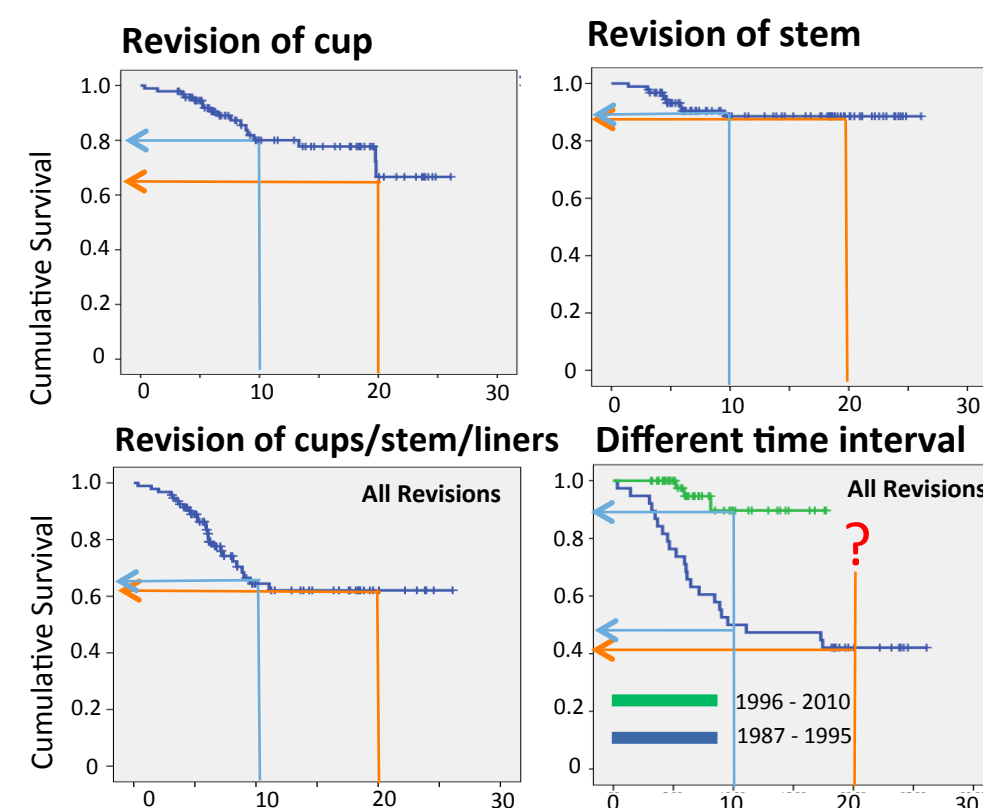


6. First revision

Revised hip number: 39 hips
Time to first revision: 6.6 ± 4.1 y (0.3 – 17.4)

Indication	Count
Wear	10
Cup loosening	9
Stem loosening	5
Acetabular osteolysis	5
Femoral osteolysis	3
Dislocation	1
Malpositioning of cup	1
Fracture	1
Procedure (total 25 hips)	
Total revision	4
Cup only	8
Stem only	3
Liner change only	10

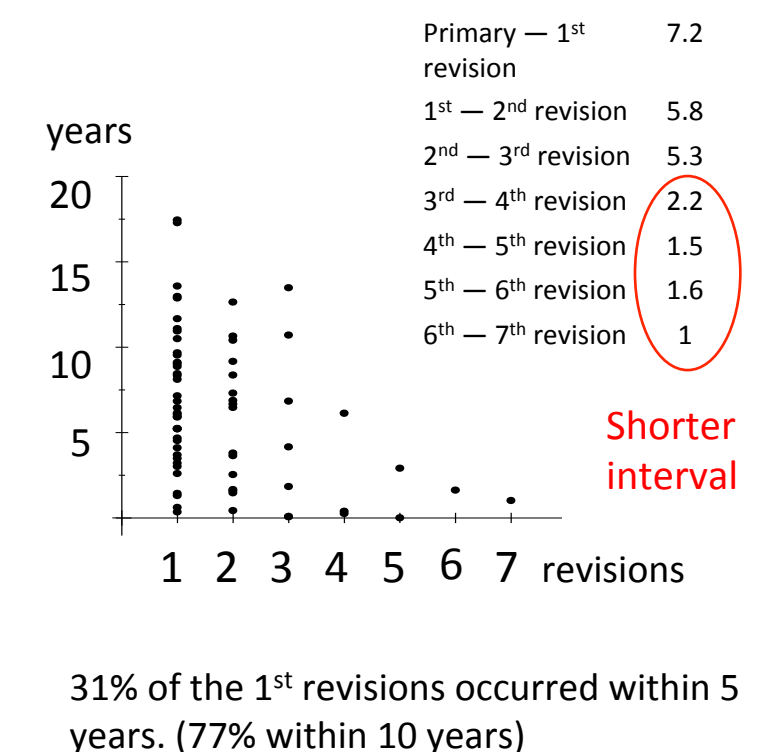
7. Primary implant 10 y and 20 y survival



8. Subsequent revision

	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	Total	(%)
Indication									
Infection	2	3	1	1	1			8	12
Dislocation	2	1	1					4	6
Fracture	1							1	1
Aseptic loosening	18	9	3	1				31	45
Osteolysis	3	3						6	9
Wear	11	2	1					14	20
Pain only	1							1	1
2-stage revision						1	1	2	3
Other	1	1			1			3	4
Type									
Total revision	6	1	1	1	1	1	1	10	14
Acetabular revision	16	9	2	2				29	42
Femoral revision	3	1	1					5	7
Liner change	11	4	3		1	1		20	29
Head change only								1	1
Total removal	3							3	4
Other		1						1	1
Total number	39	16	7	3	2	1	1	69	

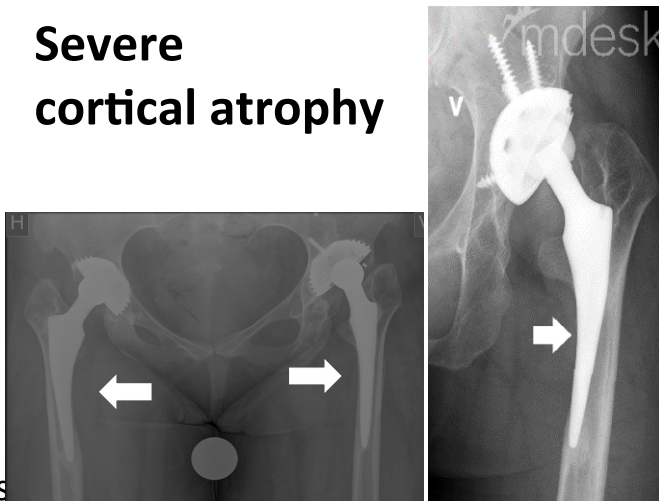
9. Revision interval



10. Final radiograph*

	Cup	Stem
Loosened implant	2	0
Osteolysis	16	26
Atrophic remodeling	54	55
Paprosky classification		
1	57	61
2A	6	12
2B	2	2
2C	8	

* Final radiographs of non-revised implants



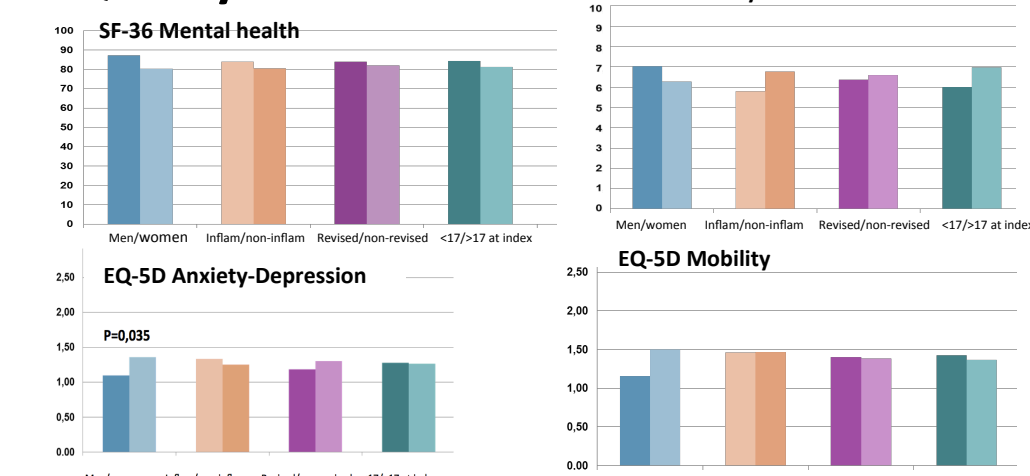
10. Epidemiology

- 60% women
- 1/3 married and have children
- > 40% bachelor or higher level university degree
- > 2/3 work or study

11. Harris Hip Score

	Mean ± SD
Pain	36 ± 10
Total	83 ± 18

12. Quality of life



Discussion

- 10-year survival rate was lower than a previous study evaluated THR under 30 years old ¹⁾ (90.3%, end-point as cup or stem change)
- Teenage patients have a higher risk for early revision than young adults
- Reduced bone stock was observed in radiographs
- Femoral atrophy and osteolysis was comparable with the previous report on THR under 30 years old with HA-coated stems²

Summary

- Implant survival rate was 80 % for cups and 89 % for stems at 10 years
- The survival improved in recent years
- Reduced bone stock is a future problem (cortical artrophy)
- Subsequent revisions occur with shorter intervals
- Regular follow-up is mandatory