Outcome of total hip replacement in young patients under 20 years of age

focusing on implant survival and radiographic outcome

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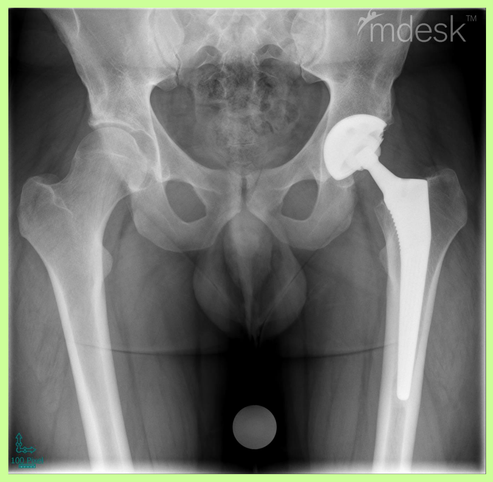

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Introduction

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 will 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.

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 Registrer
Inclusion: Primary THR under 20 years of age
Periods: 1987 – 2010
Follow-up: 1987 – 2013 (minimum 3 years follow-up)
Data collection: Register data (Diagnosis, implant names and revisions*), radiographs, medical records and Harris Hip Score (HHS) at the direct interview by one of the auther (VH).

*: Change of cups or stems or liners.

Results

1:Patient inclusion

Total number
119 patients, 141 THRs

→ Dead patients (8 patients, 9 THRs)

→ Informed consent was not available (31 patients, 38 hips)

Informed consent available
80 patients, 94 THRs

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: Primary implant

Cup

Cemented cup (10)	
MARATHON	6
REFLECTION	2
CHARNLEY	1
EXETER	1

Uncemented cup (84)	
TRILOGY	26
TROPIC	23
ATOLL	6
Others	29

Stem

Cemented stem (3)	
CHARNLEY	2
TITAN	1

Uncemented Stem (91)	
CORAIL	40
HACTIV	20
SCP/UNIQUE	12
Others	19

Head Material

Alumina	56
Steel	18
CoCr	15
Others	5

Liner

UHMWPE	56
Highly crosslinked poly	29
Alumina	4
Others	5

5: First revision

Revised hip number: 25 hips
Time to first revision: 6.6 ± 4.1 years (0.3 – 17.4)

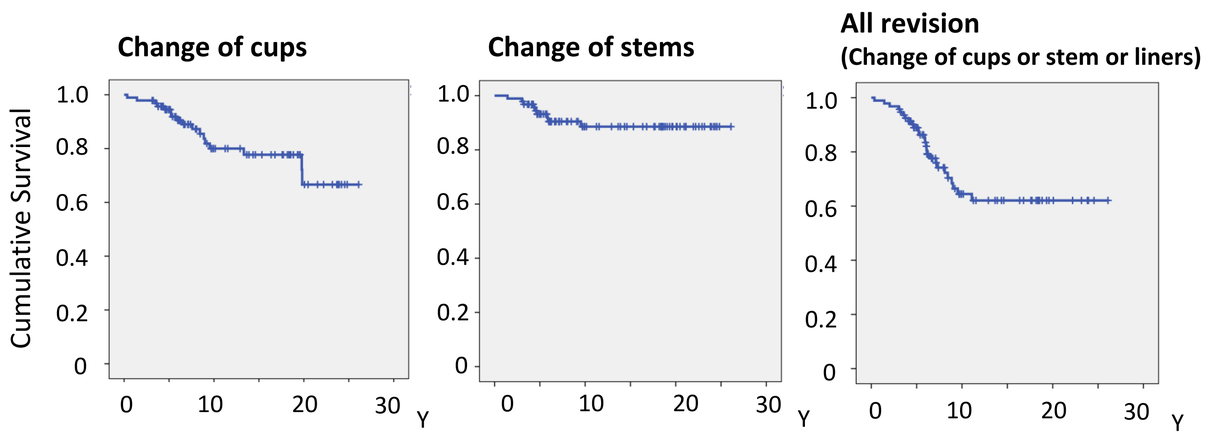
Indication

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)

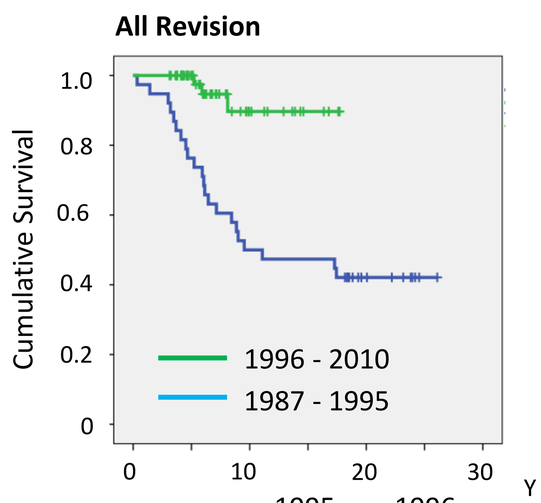
Total revision	4
Cup only	8
Stem only	3
Liner change only	10

6: Primary implant survival



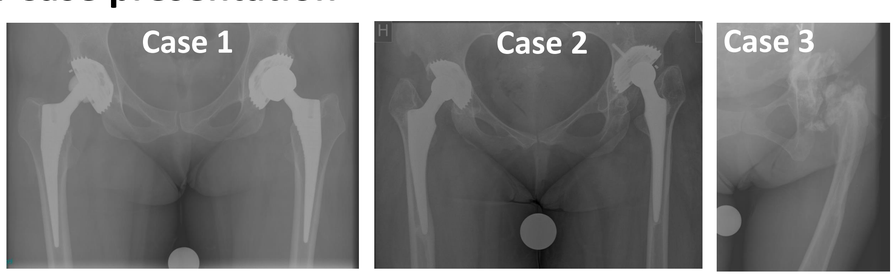
	Change of cups	Change of stems	All revision (Change of cups or stem or liners)
5 years	94.5%	93.2%	88.9%
10 years	80.0 %	88.6 %	66.4 %
15 years	77.7%	88.6%	62.1%
20 years	66.6%	88.6%	62.1%

7: Improvement in survival



	-1995	1996-
5 years	76.3 %	100 %
10 years	50.0 %	89.7 %
15 years	47.4 %	89.7 %

8: Case presentation



Age at follow-up: 35
Age at primary THR: 16 and 18
Primary indication: JRA
Clinical history: No revision
Radiograph: Stable
HHS pain/total: 35/87

Age at follow-up: 31
Age at primary THR: 13 for both
Primary indication: JRA
Clinical history: No revision
Radiograph: Sever cortex atrophy
HHS pain/total: 42/54

Age at follow-up: 43
Age at primary THR: 19
Indication: DDH
Comorbidity: myelomeningocele at L3-5
Clinical history: Infected and removed at 35.
ADL: Wheelchair since 12
HHS pain/total: 40/49

9:Final radiograph*

	Cup		Stem	
Loosened implant	2		0	
Osteolysis	16		26	
Atrophic remodeling	54		55	
Paprosky classification	**1**	57	**1**	61
	2A	6	**2**	12
	2B	2	**3A**	2
	2C	8		

* Final radiographs of non-revised implants.

10: Harris Hip Score

	Mean ± SD
Pain	36 ±10
Total	83 ± 18

11: Walking aids

	Patient number
Crutch(es)	4
Wheelchair	4

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 could have a higher risk for early revision than young adults.
- Reduced bone stock was observed in radiographs.
- The rate of femoral atrophy and osteolysis was compatible with the previous report on THR under 30 years old with HA-coated stems[2)] (atrophy: 43%, osteolysis: 22%).

Conclusion

- The implant survival rate was 80.0% for cups and 88.6% for stems at 10 years .
- The survival is improving in recent years.
- Reduced bone stock is a future problem.
- Regular follow-up is mandatory.

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.

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