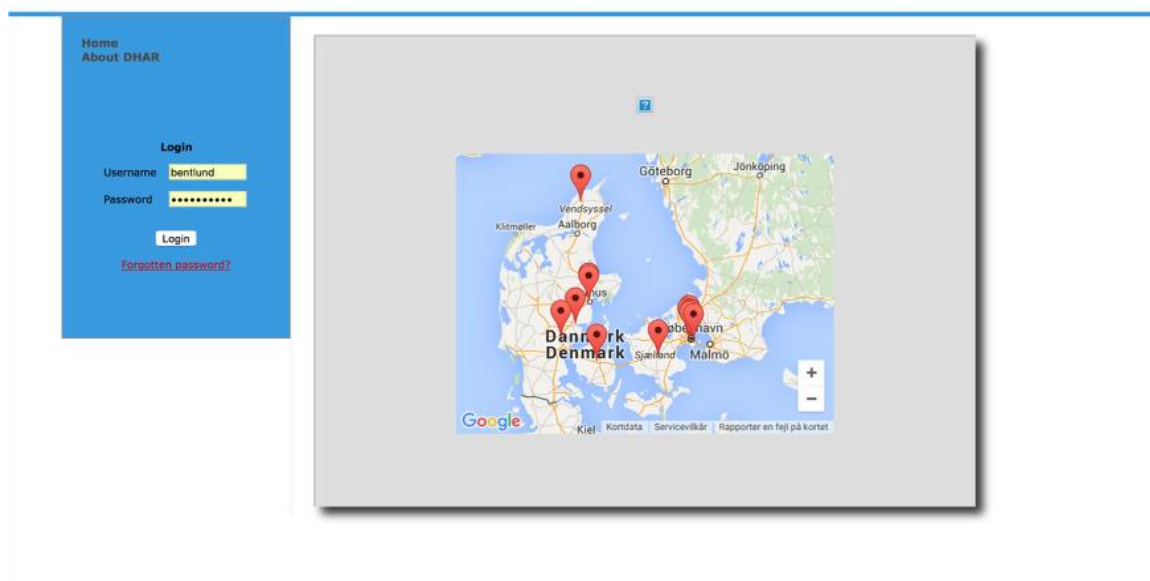


# Annual report 2022

## *Danish Hip Arthroscopy Registry*



### **Steering committee:**

- Bent Lund, Horsens Regional Hospital, chairman.
- Otto Kraemer, Amager-Hvidovre University Hospital.
- Per Hölmich, Amager-Hvidovre University Hospital.
- Niels Maagaard, Odense University Hospital.
- Søren Winge, CPH Privathospital.
- Bjarne Mygind-Klavsen, Aarhus University Hospital.
- Christian Dippmann, Bispebjerg-Frederiksberg University Hospital.
- Jens Kristinsson, Hjørring Hospital.

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## Introduction

Since 2010 hip arthroscopies have only been performed at a limited number of hospitals with specific levels of expertise in Denmark. This was based on a new Health law regulating various treatments. Furthermore, it was demanded that the hospitals and clinics registered the procedures they performed. This gave the inspiration for a national hip arthroscopy registry. The Danish Hip Arthroscopy Registry (DHAR) was initiated in 2012 and the development was funded by a grant from The Danish Association of Arthroscopy and Sports Ortopedics (SAKS). DHAR is one of only two national non-arthroplasty hip registries existing so far.

Permission was granted for the Registry in 2012 (Region Midt # 1-16-02-215-12)  
Data Agreement according to the GDPR-rules was signed in 2019 (# 2012 - 1-16-02-215-12).

DHAR has been open to submissions on-line since the beginning of 2012 and the database structure has been modified several times over the years, mainly because of minor flaws and programming errors that had to be adjusted and corrected. The Steering Committee meets twice a year and ad-hoc decisions, and data requests are handled pr. e-mail or on-line meetings.

In 2016 the first full Annual report was published and since then we have published annual reports. Peer reviewed papers based on data from the DHAR will also be listed here and in fact several have already been published [1–14]. See the publication list p. 48.

DHAR is run by a voluntary effort among the participating surgeons and the actual database is run by Procordo Inc., a Danish software company hosting a variety of orthopedic registries.

DHAR is solely funded by the participating hospitals and private clinics.

Bent Lund  
Chairman of the Steering Committee.



## DHAR

The Danish Hip Arthroscopy Registry is based on a flowchart, which forms the basic structure and makes it possible to access the various parts of the Registry in the flowchart.



The patients access the Registry through a “kiosk”, where they can enter their data on-line and complete the pre-scores in the Patient Related Outcome Measures (PROM). At the time of surgery, the surgeon enters the operative findings and other variables on-line.

When the patients are signed up for hip arthroscopy, they enter the following Patient Related Outcome Measures (PROM) into the registry: HAGOS, iHOT<sub>12</sub>, HSAS, VAS-overall hip function, NRS pain-rest and NRS pain-walk and EQ5D scores.

The surgeons enter the following data at the time of surgery: various radiographic measurements, previous surgery, anesthesia, antibiotics, DVT-prophylaxis, labral tear, cartilage lesions, other injuries, OR-time, traction time, surgical procedures, number of anchors and type, cartilage treatment, bony work, extraarticular surgery and perioperative complications.

The DHAR generates an automatic e-mail notification to the patients at follow-ups 1, 2, 5 and 10 years after surgery with a link to an on-line questionnaire. If they do not respond another e-mail is automatically generated as a reminder.

The registry makes it possible to extract data on the actual patient, but also, on groups of patients or different treatment modalities or types of injuries. All surgeons have access to their own data, but only the steering committee have full access to the data. The database is secure and not open to public access. Data can only be made available on written request and with a research protocol stating the type of request. Permission must be granted by the Danish Data Protection Agency.

## Quality indicators

We have chosen four indicators of quality for this registry. We find that these data can indicate whether the registry data are valid or not and give some information of the quality of the surgery. The problem with registry data is the completeness, which usually are low (known also from the Scandinavian ACL registries). Therefore, we have provided data to support the validity of the registry data. We have published a study in 2020 with data from DHAR, that shows that completeness and patient characteristics are the same between responders and non-responders [8].

There is still a problem with data from the National Patient Registries, but we are working on it, and we hope to be able to present updated data next year. We also hope to be able to present data for hip joint survival.

During the next year we will try to increase the PROM completeness. We don't know whether it is a patient or surgeon fatigue. The improvement of QoL in HAGOS seems to be satisfactory and above the target.

Re-arthroscopies are increasing in numbers as well as in percent. We think this might be caused by the surgeons being less reluctant to doing re-arthroscopies. Looking at the results we have no explanations why the re-arthroscopies are increasing in numbers.

### Completeness (surgeon) DHAR/LPR (Danish National Patients Registry) Target 90 %

**Table 1.** Number of Hip Arthroscopic procedures reported in DHAR and LPR

Completeness	2012	2013	2014	2015	2016	2017	2018*
DHAR	450	709	936	921	803	757	<b>505</b>
LPR	576	827	1201	1042	826	880	<b>571</b>
DHAR/LPR (%)	78.1	85.7	77.9	88.4	97.2	86.0	<b>88.4</b>

\*Data included up until September 2018. Due to procedural changes accessing data from the National Patient Registries, data is not yet available after September 2018.

### Completeness of PROMS (patient)/DHAR (surgeon) Pre-op. Target 65%

**Table 2.** Number of PROMS completed compared to surgical registrations in DHAR.

Completeness PROMS (n (%))	2012-2019	2020	2021	2022	Total
Pre	<b>3572</b> (57)	<b>532</b> (63)	<b>455</b> (59)	<b>340</b> (47)	<b>4899</b> (57)
1 year	<b>3330</b> (54)	<b>417</b> (50)	<b>295</b> (39)	-	<b>4056</b> (52)
2 years	<b>2684</b> (43)	<b>250</b> (30)	-	-	<b>2942</b> (42)
5 years	<b>1420</b> (32)	-	-	-	<b>1420</b> (32)

**QoL improvement >25 points**

**1-year Target 45 %**

**Table 3.** The number of patients reaching an improvement in HAGOS item QoL of more than 25 points at 1, 2 and 5 years

HAGOS QOL (n (%))	2012-2019	2020	2021	2022	Total
1 year	<b>976</b> (44)	<b>160</b> (47)	<b>128</b> (46)	-	<b>1269</b> (45)
2 years	<b>878</b> (50)	<b>126</b> (54)	-	-	<b>1008</b> (50)
5 years	<b>462</b> (55)	-	-	-	<b>462</b> (55)

**Re-arthroscopies**

**Target <12 %**

**Table 4.** Re-arthroscopies per year

Re-arthroscopies (n (%))	2012-2019	2020	2021	2022	Total
Re-arthroscopies pr. year (n (%))	<b>738</b> (12)	<b>103</b> (12)	<b>98</b> (13)	<b>114</b> (16)	<b>1053</b> (12)

## Overall data

At the end of 2022 there were a total of **8544 arthroscopic hip surgeries** registered in DHAR. Data presented in this annual report is a summation of all the registrations since 2012 and until Dec. 31<sup>st</sup>, 2022. There are in total 8544 **procedures** and **4899 Pre-PROM datasets** from patients.

**Table 5.** In Denmark **12** public hospitals and clinics have a Regional Function (®) in hip arthroscopy, which means that they have permission to perform surgery on public healthcare patients. There are also 4 private clinics operating only on privately insured patients who contribute to the registry. In total **16** hospitals and clinics have reported to the DHAR.

Year	2012-2019	2020	2021	2022	Total
North Region					
Hjørring Regionshospital ®	611	89	49	44	793
Mid Region					
Aarhus Universitetshospital ®	381	32	29	44	486
Aleris Hamlet Aarhus ®	589	54	54	43	740
Horsens Regionshospital ®	1363	169	156	162	1850
Capio Aarhus	11	6	15	6	38
South Region					
Odense Universitetshospital OUH ®	598	46	33	30	707
Privathospitalet Mølholm	237	52	53	40	382
Capital Region					
Aleris Hamlet København ®	528	148	153	160	989
AHH Amager Hvidovre Hospital ®	478	76	68	65	687
Bispebjerg Frederiksberg Hospital ®	311	84	65	32	492
Capio Hellerup ®	757	18	45	54	874
Gildhøj Privathospital	78	3	0	0	81
ADEAS Parken ®	243	0	0	0	243
CPH Privathospital	15	54	45	36	150
Zealand Region					
Køge Sygehus®	5	6	1	8	20
Aleris Hamlet Ringsted	9	0	0	0	9
<b>Total # procedures</b>	<b>6214</b>	<b>837</b>	<b>766</b>	<b>724</b>	<b>8541</b>



**Table 6.** Demographic data

Demographics	2012-2019	2020	2021	2022	Total
Male	2592	330	316	276	3514
Female	3622	520	450	448	5030
Ratio (m/f)	42/58	39/61	41/59	38/62	41/59
Mean age (year)	37.6	36.5	36.9	35.7	37.3

## Previous surgery

**Table 7.** Of the 8544 procedures 1737 had previous surgery in the affected hip. Among these were 447 patients, who were operated with a PAO (Peri-Acetabular Osteotomy) due to developmental dysplasia of the hip (DDH). Finally, 53 patients had a previous THR (Total Hip Replacement).

Previous surgery (n)	2012-2019	2020	2021	2022	Total
FAI	737	106	100	114	1057
Loose bodies /chondromatosis	13	1	0	0	14
Lig. teres rupture	5	0	0	0	5
Infection	2	0	0	0	2
PAO	355	34	30	28	447
Osteosynthesis of SCFE	30	4	6	3	43
Z-plasty ITB	25	0	1	2	28
THR	41	2	6	4	53
Other	78	4	3	3	88
<b>Total</b>	1286	151	146	154	1737

## OR time

**Table 8.** Total OR-time (knife-time) and total traction time

OR time	2012-2019	2020	2021	2022	Total
Total OR-time (min)	76	64	63	61	72
Total traction time (min)	45	42	40	40	44



## Radiology

**Table 9.** Radiological parameters

Radiology	2012-2019	2020	2021	2022	Total
LCE-angle (Wiberg) (mean)	31	29	30	30	31
Anterior alpha angle (mean)	67	66	67	65	67
Tönnis AI-angle (mean)	5.5	5.5	5.2	5.3	5.5
Ischial spine sign (n (%))	1610 (26)	189 (23)	150 (20)	156 (22)	2105 (25)
Lateral Joint Space Width (n (%))					
<2 mm.	35 (1)	3 (0)	2 (0)	1 (0)	41 (1)
2,1-3,0 mm.	260 (4)	23 (3)	34 (4)	22 (3)	339 (4)
3,1-4,0 mm.	1928 (31)	233 (28)	244 (32)	173 (24)	2578 (30)
>4 mm.	3982 (64)	578 (69)	480 (64)	524 (73)	5564 (65)

## Bony work

**Table 10.** Relationship between rim-trimming and femoroplasty

Bony work (n (%))	2012-2019	2020	2021	2022	Total
Isolated femoroplasty	1138 (20)	108 (14)	92 (12)	90 (13)	1428 (18)
Isolated acetabular rimtrimming	709 (12)	151 (19)	144 (20)	166 (25)	1170 (15)
Comb. femoroplasty-rimtrimming	3936 (68)	540 (67)	491 (68)	419 (62)	5386 (67)

## Labral surgery

**Table 11.** Labral findings and procedures

Labral tear (n (%))	2012-2019	2020	2021	2022	Total
Yes	5463 (88)	795 (95)	723 (94)	682 (94)	7663 (90)
No	751 (12)	45 (5)	43 (6)	42 (6)	881 (10)
Type of Surgery (n (%))	2012-2019	2020	2021	2022	Total
Labrum untouched (no treatment)	10 (0)	0 (0)	2 (0)	0 (0)	12 (0)
Labral remodelling/ partial resection	640 (12)	82 (11)	71 (10)	66 (10)	859 (12)
Labral full thickness resection	276 (5)	48 (6)	60 (8)	73 (11)	457 (6)
Labral repair	4365 (79)	654 (82)	575 (80)	535 (78)	6129 (80)
Labral reconstruction	27 (1)	3 (0)	0 (0)	1 (0)	31 (0)
Unknown	145 (3)	8 (1)	15 (2)	7 (1)	175 (2)



## Cartilage lesions

**Table 12.** Size and grading of cartilage lesions in the acetabulum and femoral head

<b>Cartilage lesion Acetabulum n (%)</b>	<b>2012-2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>Total</b>
Beck Gr. 0 – Healthy	<b>108</b> (2)	<b>16</b> (2)	<b>24</b> (4)	<b>18</b> (3)	<b>166</b> (2)
Beck Gr. 1 – Fibrillation	<b>820</b> (15)	<b>121</b> (16)	<b>116</b> (17)	<b>104</b> (18)	<b>1161</b> (16)
Beck Gr. 2 - Wave sign	<b>2303</b> (43)	<b>353</b> (47)	<b>304</b> (45)	<b>274</b> (46)	<b>3234</b> (44)
Beck Gr. 3 - Delamination	<b>1540</b> (29)	<b>202</b> (27)	<b>182</b> (27)	<b>154</b> (26)	<b>2078</b> (28)
Beck Gr. 4 - Exposed bone	<b>554</b> (11)	<b>63</b> (8)	<b>53</b> (8)	<b>42</b> (7)	<b>712</b> (10)

<b>Acetabular cartilage lesion size (n (%))</b>	<b>2012-2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>Total</b>
0	<b>124</b> (2)	<b>20</b> (3)	<b>26</b> (4)	<b>18</b> (3)	<b>188</b> (3)
Size <1 cm <sup>2</sup>	<b>1770</b> (33)	<b>312</b> (41)	<b>278</b> (41)	<b>257</b> (43)	<b>2617</b> (35)
Size 1-2 cm <sup>2</sup>	<b>2684</b> (51)	<b>335</b> (44)	<b>300</b> (44)	<b>251</b> (42)	<b>3570</b> (49)
Size >2 cm <sup>2</sup>	<b>747</b> (14)	<b>88</b> (12)	<b>75</b> (11)	<b>66</b> (11)	<b>976</b> (13)

<b>Cartilage lesion Head (n (%))</b>	<b>2012-2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>Total</b>
ICRS Gr. 0 – Normal	<b>3736</b> (70)	<b>486</b> (65)	<b>446</b> (65)	<b>423</b> (71)	<b>5091</b> (69)
ICRS Gr. 1 - Almost normal	<b>467</b> (9)	<b>85</b> (11)	<b>65</b> (10)	<b>55</b> (9)	<b>672</b> (9)
ICRS Gr. 2 – Abnormal	<b>695</b> (13)	<b>112</b> (15)	<b>94</b> (14)	<b>58</b> (10)	<b>959</b> (13)
ICRS Gr. 3 - Severely Abnormal	<b>286</b> (5)	<b>54</b> (7)	<b>55</b> (8)	<b>44</b> (8)	<b>439</b> (6)
ICRS Gr. 4 - Exposed bone	<b>141</b> (3)	<b>18</b> (2)	<b>19</b> (3)	<b>12</b> (2)	<b>190</b> (3)

<b>Femoral head lesion size (n (%))</b>	<b>2012-2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>Total</b>
0	<b>3764</b> (71)	<b>492</b> (66)	<b>459</b> (67)	<b>434</b> (73)	<b>5149</b> (70)
Size < 1 cm <sup>2</sup>	<b>477</b> (9)	<b>75</b> (10)	<b>65</b> (10)	<b>42</b> (7)	<b>659</b> (9)
Size 1-2 cm <sup>2</sup>	<b>650</b> (12)	<b>109</b> (14)	<b>94</b> (14)	<b>77</b> (13)	<b>930</b> (13)
Size > 2 cm <sup>2</sup>	<b>434</b> (8)	<b>79</b> (10)	<b>61</b> (9)	<b>39</b> (7)	<b>613</b> (8)



## Cartilage surgery

**Table 13.** Types of cartilage treatment (most patients had a combination of treatments)

Type of cartilage surgery	2012-2019	2020	2021	2022	Total
Cartilage resection on femoral head	211 (4)	28 (3)	28 (4)	8 (1)	275 (3)
Cartilage resection in acetabulum	1860 (33)	189 (22)	179 (23)	157 (24)	2385 (30)
Microfracture on femoral head	18 (0)	1 (0)	2 (0)	2 (0)	23 (0)
Microfracture in acetabulum	222 (4)	12 (1)	19 (2)	10 (1)	263 (3)
Cartilage refixation on femoral head	2 (0)	0 (0)	0 (0)	0 (0)	2 (0)
Cartilage refixation in acetabulum	22 (0)	5 (1)	1 (0)	3 (0)	31 (0)
Debridement with RF-wand	3246 (59)	642 (73)	570 (71)	513 (74)	4971 (63)
Other	13 (0)	1 (0)	0 (0)	0 (0)	14 (0)

## Extraarticular surgery

**Table 14.** Additional extraarticular procedures

Type of extraart. proc. (n (%))	2012-2019	2020	2021	2022	Total
Partial AHS resection	55 (1)	5 (1)	6 (1)	6 (1)	72 (1)
Psoas tenotomy	304 (5)	11 (1)	15 (2)	12 (2)	342 (4)
Reinsertion of gluteus medius	11 (0)	2 (0)	0 (0)	0 (0)	13 (0)
Z-plasty ITB	33 (1)	5 (1)	2 (0)	2 (0)	42 (0)
Resection of trochanteric bursa	46 (1)	4 (0)	1 (0)	3 (0)	54 (1)
Capsular closure	1402 (23)	355 (43)	348 (45)	311 (43)	2416 (27)
Remov. of hardware (AO-screws)	59 (1)	8 (1)	9 (1)	7 (1)	83 (1)
Removal of heterotopic ossification	56 (1)	8 (1)	8 (1)	9 (1)	81 (1)
Osteosynthesis of os acetabuli	5 (0)	0 (0)	0 (0)	0 (0)	5 (0)
Removal of os acetabuli	46 (1)	4 (0)	10 (1)	3 (0)	63 (1)
Infection of bone cyst	10 (0)	3 (0)	0 (0)	1 (0)	14 (0)
Other	76 (1)	3 (0)	3 (0)	3 (0)	86 (1)
<b>Total</b>	<b>2103 (33)</b>	<b>409 (48)</b>	<b>402 (52)</b>	<b>357 (49)</b>	<b>3271 (38)</b>



## Types of complications during surgery

**Table 15.** Complications reported during surgery.

Type of complications (n (%))	2012-2019	2020	2021	2022	Total
Labrum cut	61 (1)	4 (0)	3 (0)	4 (1)	72 (1)
Anchor pull-out	109 (2)	11 (1)	14 (2)	13 (2)	147 (2)
Anchor penetration acetabular surface	55 (1)	3 (0)	1 (0)	4 (1)	63 (1)
Suture-defect (break, pull-out, etc.)	181 (3)	12 (2)	11 (1)	13 (2)	217 (3)
Broken instrument	56 (1)	5 (1)	3 (0)	2 (0)	66 (1)
Loss of traction	5 (0)	1 (0)	1 (0)	0 (0)	7 (0)
"Not possible to apply traction"	30 (0)	7 (1)	8 (1)	4 (1)	49 (1)
Other	118 (2)	14 (2)	10 (1)	12 (2)	154 (2)
<b>Total</b>	<b>615 (10)</b>	<b>57 (7)</b>	<b>51 (7)</b>	<b>52 (7)</b>	<b>775 (9)</b>

## Antibiotic prophylaxis and DVT prophylaxis

**Table 16.** Use of antibiotics and DVT prophylaxis. The shift from Dicloxacillin to Cloxacillin in 2020 is due to praxis in the public healthcare medicine assortment.

Antibiotics (n (%))	2012-2019	2020	2021	2022	Total
Dicloxacillin	2130 (34)	101 (12)	76 (10)	79 (11)	2386 (28)
Cefuroxim	3825 (62)	516 (61)	524 (68)	512 (71)	5377 (63)
Cloxacillin	24 (0)	216 (26)	165 (22)	131 (18)	536 (6)
Other	4 (0)	2 (0)	0 (0)	0 (0)	6 (0)
<b>Total</b>	<b>5983 (96)</b>	<b>835 (99)</b>	<b>765 (100)</b>	<b>722 (100)</b>	<b>8305 (97)</b>
DVT Prophylaxis (n (%))	2012-2019	2020	2021	2022	Total
Dalteparin (Fragmin)	62 (1)	3 (0)	3 (0)	0 (0)	68 (1)
Fondaparinux (Arixtra)	1 (0)	0 (0)	0 (0)	0 (0)	1 (0)
Tinzaparin (Innohep)	189 (3)	2 (0)	0 (0)	0 (0)	191 (2)
Rivaroxaban (Xarelto)	832 (13)	43 (5)	42 (5)	37 (5)	954 (11)
<b>Total</b>	<b>1084 (17)</b>	<b>48 (6)</b>	<b>45 (6)</b>	<b>37 (5)</b>	<b>1177 (14)</b>

## Patient Reported Outcome Measures (PROMs)

### Comments to the PROMs:

The data show significant improvements in all PROMs but one.

The improvements in all PROMs are larger than the MCID (Minimal Clinical Important Difference, defined as SD/2 of the pre-operative values), except for HSAS. This exception is in accordance with the published paper on “Return to sport” [4]. The largest improvement is seen between pre-op and 1-year post-op. Table 23 shows the percentage reaching the MCID. At 5 years the MCID improvement is still between 1.7 and 3.8 times the preoperative value, except for HSAS and EQ5D (Table 23).

Regarding HAGOS the improvements are also significant for PA and QoL (Physical Activity and Quality of Life) between 1 and 2 years and between 2 and 5 years. This late improvement might be explained by a change in patients’ expectations over time, because of accepting their hip function as it is, even if it is not at the level of a hip symptom-free control group (*Thorborg K. et al. Patient-Reported Outcomes Within the First Year After Hip Arthroscopy and Rehabilitation for Femoroacetabular Impingement and/or Labral Injury. The Difference Between Getting Better and Getting Back to Normal. Am J Sport Med 2018;46(11):2607–2614*).

**Table 17.** HAGOS (Copenhagen Hip and Groin Outcome Score)

PROMS pre (n=4899 (57%))	2012-2019	2020	2021	2022	Mean (95% CI)
HAGOS					
Pain	49.8	48.7	48.6	49.2	49.5 (48.9 - 50.1)
Symptoms	47.9	46.5	47.2	46.4	47.6 (47.1 - 48.2)
ADL	51.4	52.1	52.1	52.8	51.7 (50.9 – 52.4)
Sport & rec	34.3	32.7	33.6	35.8	34.2 (33.5 – 34.9)
PA	21.0	18.4	18.6	22.6	20.6 (19.9 - 21.4)
QOL	28.9	28.1	27.3	28.4	28.6 (28.1 - 29.1)

PROMS 1 year (n=4056 (52%))	2012-2019	2020	2021	-	Mean (95% CI)
HAGOS					
Pain	69.3	70.1	69.9	-	69.4 (68.6 - 70.2)
Symptoms	65.1	65.9	65.8	-	65.2 (64.5 – 66.0)
ADL	71.7	74.1	74.4	-	72.2 (71.3 – 73.1)
Sport & rec	56.5	59.5	58.4	-	56.9 (55.9 - 58.0)
PA	42.4	43.3	44.3	-	42.6 (41.4 - 43.8)
QOL	50.6	51.3	51.1	-	50.7 (49.8 - 51.7)



<b>PROMS 2 years (n=2942 (42%))</b>	<b>2012-2018</b>	<b>2019</b>	<b>2020</b>	<b>-</b>	<b>Mean (95% CI)</b>
HAGOS					
Pain	<b>70.6</b>	<b>71.2</b>	<b>71.7</b>	-	<b>70.7 (69.7 - 71.6)</b>
Symptoms	<b>65.7</b>	<b>66.6</b>	<b>65.7</b>	-	<b>65.8 (64.9 - 66.6)</b>
ADL	<b>73.0</b>	<b>74.9</b>	<b>74.5</b>	-	<b>73.4 (72.3 - 74.4)</b>
Sport & rec	<b>57.2</b>	<b>58.8</b>	<b>58.5</b>	-	<b>58.5 (57.3 - 59.7)</b>
PA	<b>46.4</b>	<b>48.9</b>	<b>47.9</b>	-	<b>46.8 (45.3 - 48.2)</b>
QOL	<b>54.0</b>	<b>54.2</b>	<b>54.7</b>	-	<b>54.1 (53.0 - 55.1)</b>

<b>PROMS 5 years (n=1420 (32%))</b>	<b>2012-2015</b>	<b>2016</b>	<b>2017</b>	<b>-</b>	<b>Mean (95% CI)</b>
HAGOS					
Pain	<b>72.9</b>	<b>74.0</b>	<b>71.8</b>	-	<b>72.9 (71.6 - 74.2)</b>
Symptoms	<b>67.4</b>	<b>69.0</b>	<b>65.9</b>	-	<b>67.4 (66.1 - 68.7)</b>
ADL	<b>74.7</b>	<b>77.1</b>	<b>74.0</b>	-	<b>75.0 (73.6 - 76.5)</b>
Sport & rec	<b>60.2</b>	<b>64.2</b>	<b>58.9</b>	-	<b>60.8 (59.0 - 62.5)</b>
PA	<b>51.2</b>	<b>53.8</b>	<b>49.9</b>	-	<b>51.6 (49.5 - 53.6)</b>
QOL	<b>57.8</b>	<b>59.8</b>	<b>55.7</b>	-	<b>57.8 (56.2 - 59.4)</b>

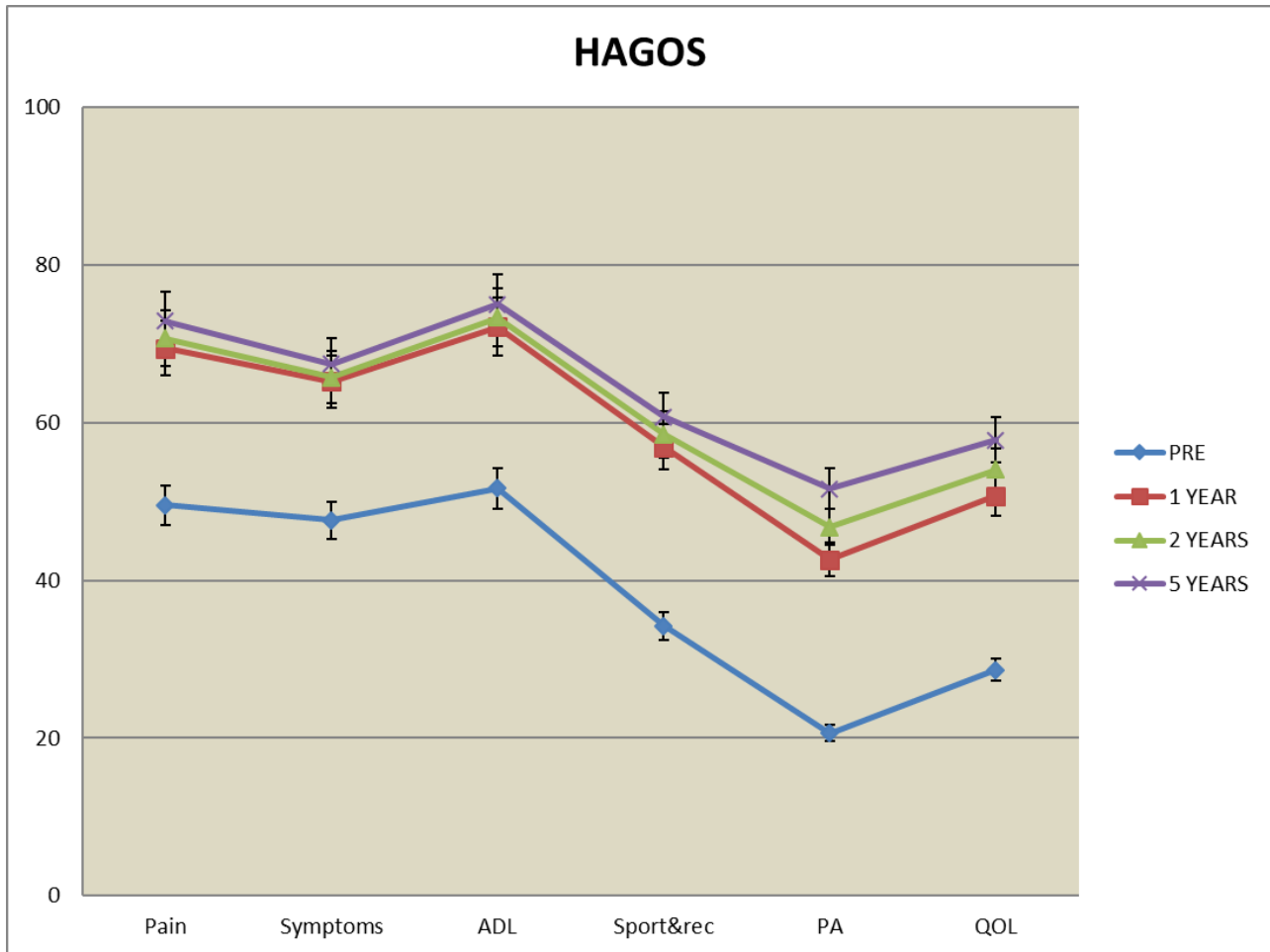


Fig. 1. HAGOS outcomes at 1, 2 and 5 years compared to the pre-scores.

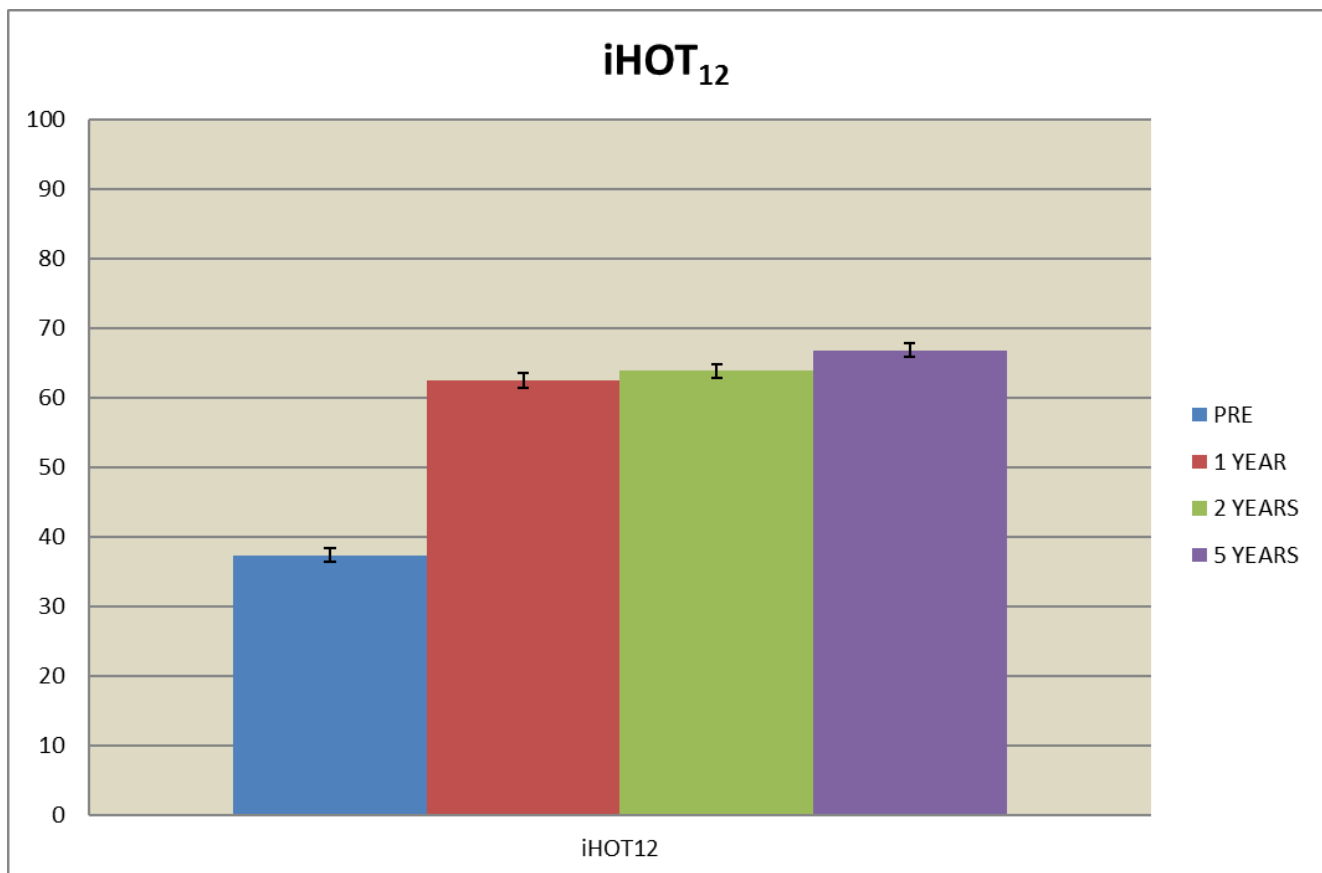




### iHOT<sub>12</sub>

**Table 18.** iHOT<sub>12</sub> data pre-operatively are only valid from 2019 and forward. The data from 5 years have no pre-op data yet, but they will be included in the coming years.

iHOT <sub>12</sub>	2012-2019	2020	2021	2022	Mean (95% CI)
Pre (n=1499)	37.7	37.0	36.9	38.0	37.3 (36.4 – 38.3)
1 year (n=1327)	62.1	63.0	62.8	-	62.5 (61.0 – 63.9)
2 years (n=1009)	64.0	63.1	-	-	63.8 (62.1 – 65.5)
5 years (n=853)	66.8	-	-	-	66.8 (65.0 – 68.6)



**Fig. 2.** iHOT<sub>12</sub> outcomes at 1, 2 and 5 years compared to the pre-scores.

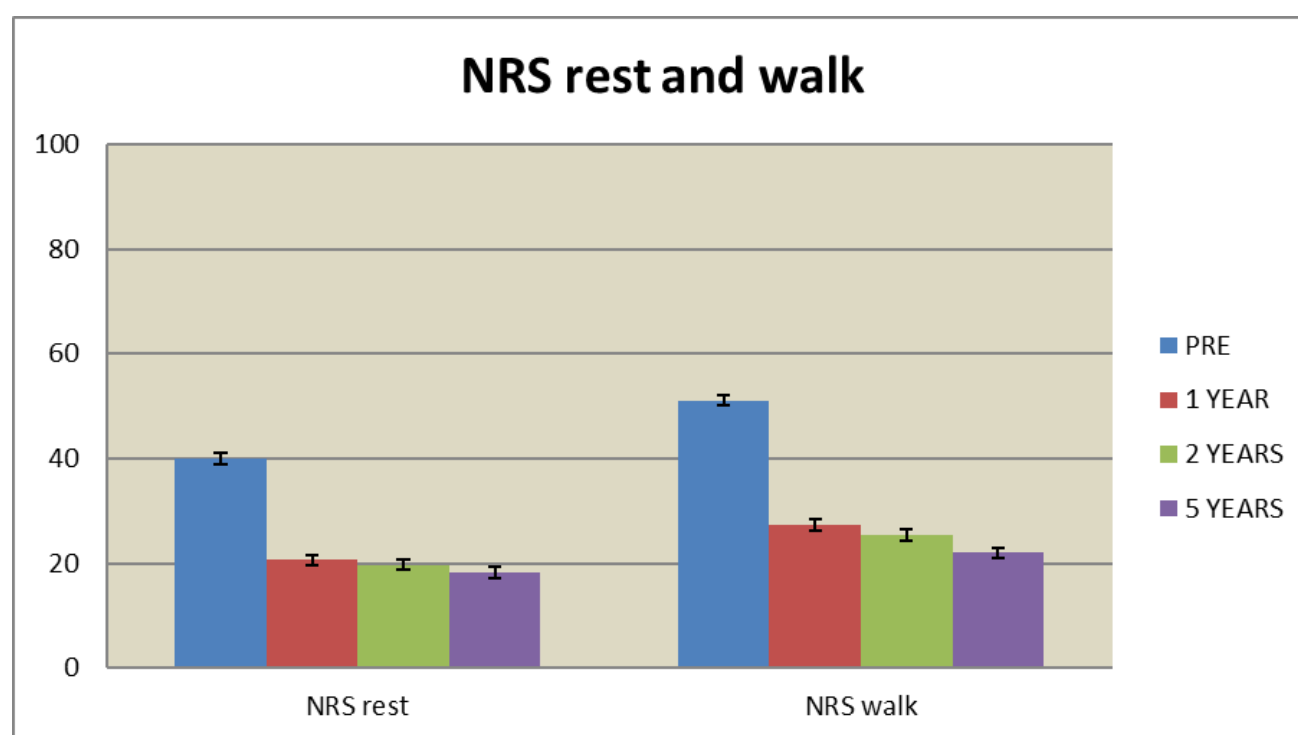


## NRS scores for pain

**Table 19.** Numerical Rating Scale for pain at rest and after 15 minutes of walking.

NRS Pain - rest	2012-2019	2020	2021	2022	Mean (95% CI)
Pre	40.2	39.7	39.3	39.3	40.0 (39.2 – 40.8)
1 year	20.7	20.3	20.3	-	20.6 (19.8 – 21.4)
2 years	19.7	19.1	-	-	19.7 (18.7 – 20.6)
5 years	18.2	-	-	-	18.3 (17.0 – 19.6)

NRS pain – walking 15 mins.	2012-2019	2020	2021	2022	Mean (95% CI)
Pre	51.3	50.3	49.8	51.1	51.1 (50.2 – 51.9)
1 year	28.0	24.9	23.6	-	27.3 (26.3 – 28.3)
2 years	25.3	26.0	-	-	25.4 (24.3 – 26.5)
5 years	22.0	-	-	-	22.0 (20.5 – 23.6)

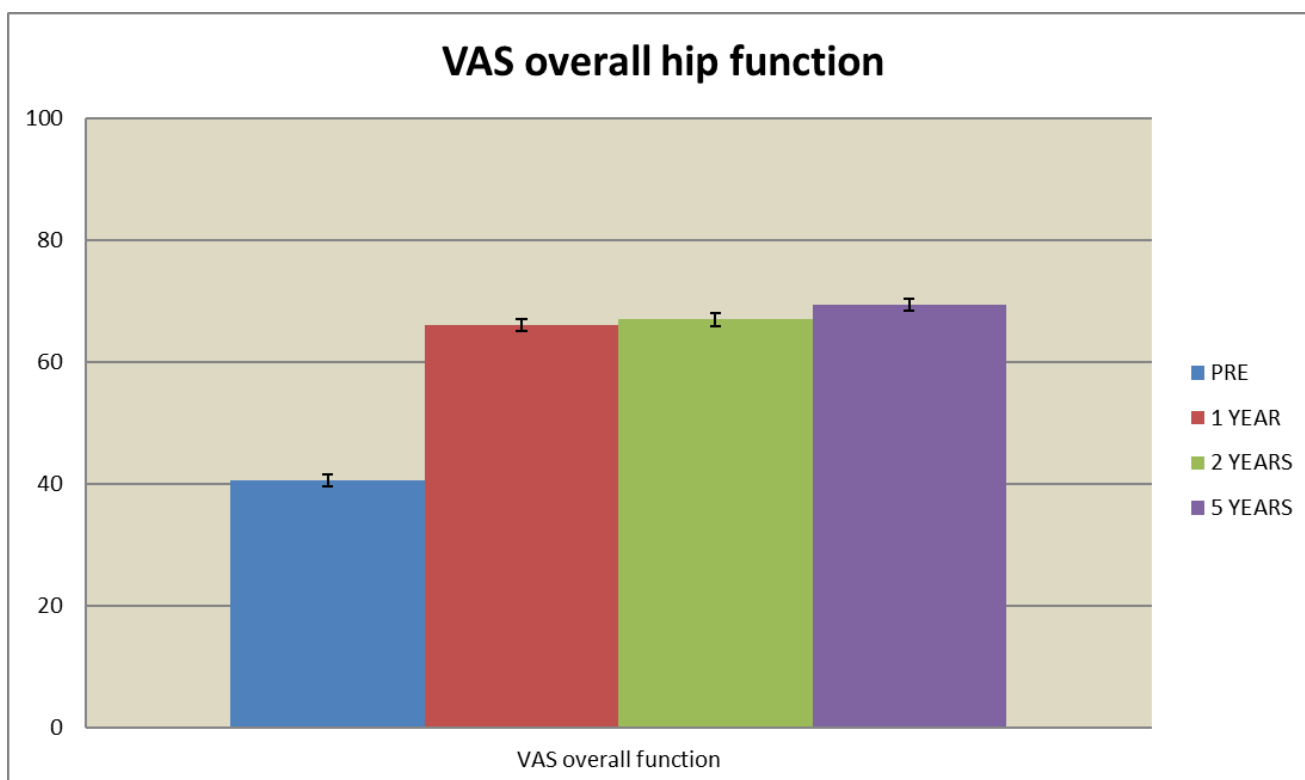
**Fig. 3.** NRS pain score at rest and after 15 min. walk. Outcome data at 1, 2 and 5 years compared to the pre-scores.



### Overall hip function

**Table 20.** The patient’s opinion of their overall hip function. 100 is perfect without hip symptoms.

VAS – overall hip function	2012-2019	2020	2021	2022	Mean (95% CI)
Pre	41.0	39.2	39.9	38.7	40.5 (39.9 – 41.1)
1 year	66.0	66.4	65.8	-	66.0 (65.1 – 66.9)
2 years	67.0	66.7	-	-	66.9 (65.9 – 68.0)
5 years	69.4	-	-	-	69.4 (67.9 – 70.9)



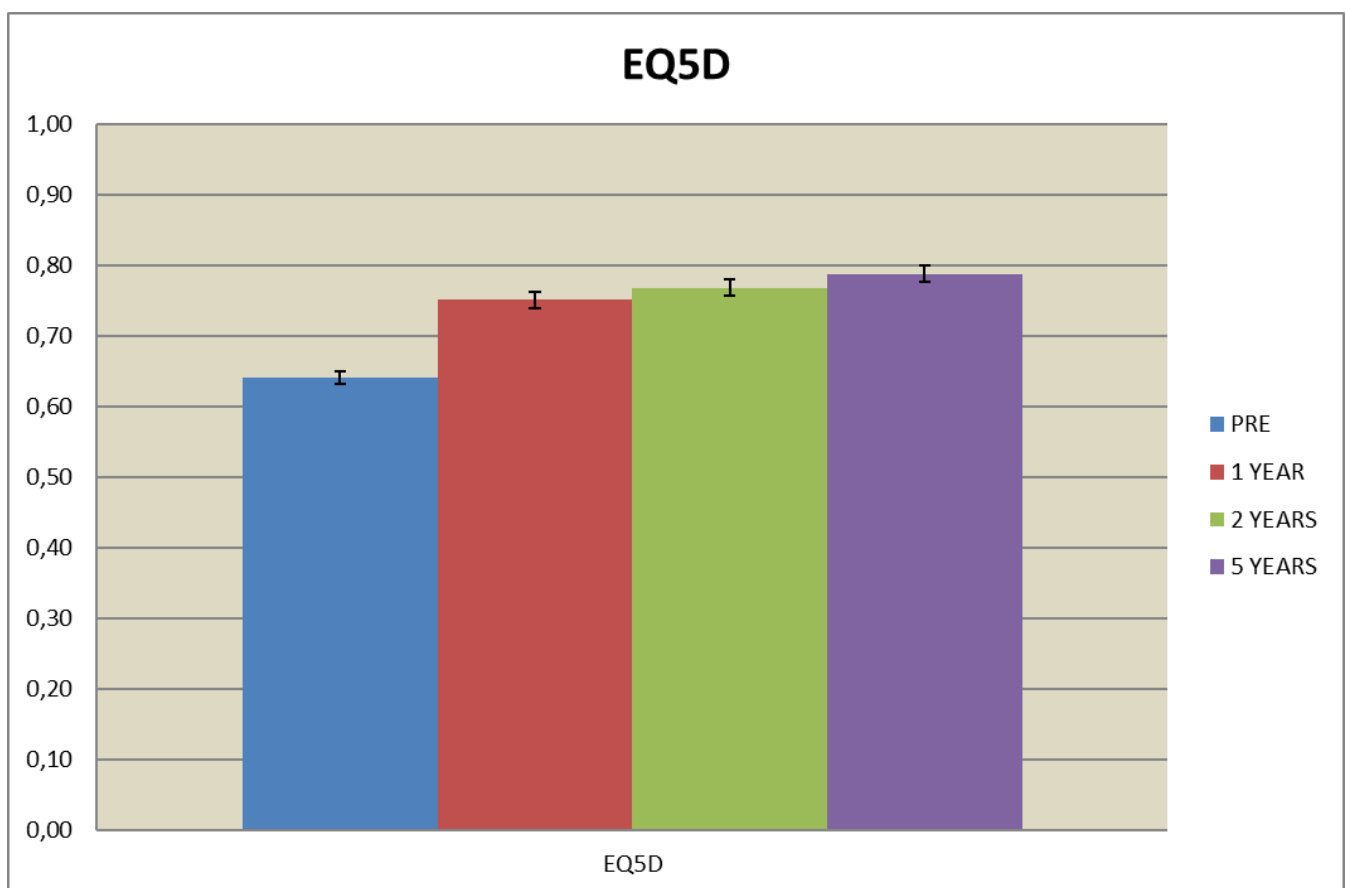
**Fig. 4.** VAS overall hip function outcome at 1, 2 and 5 years compared to the pre-scores



### EQ5D scores

**Table 21.** Patient assessed general quality of life score.

EQ5D	2012-2019	2020	2021	2022	Mean (95% CI)
Pre	0.64	0.63	0.65	0.64	0.64 (0.64 - 0.65)
1 year	0.75	0.75	0.77	-	0.75 (0.75 - 0.76)
2 years	0.77	0.77	-	-	0.77 (0.76 - 0.78)
5 years	0.79	-	-	-	0.79 (0.78 - 0.80)



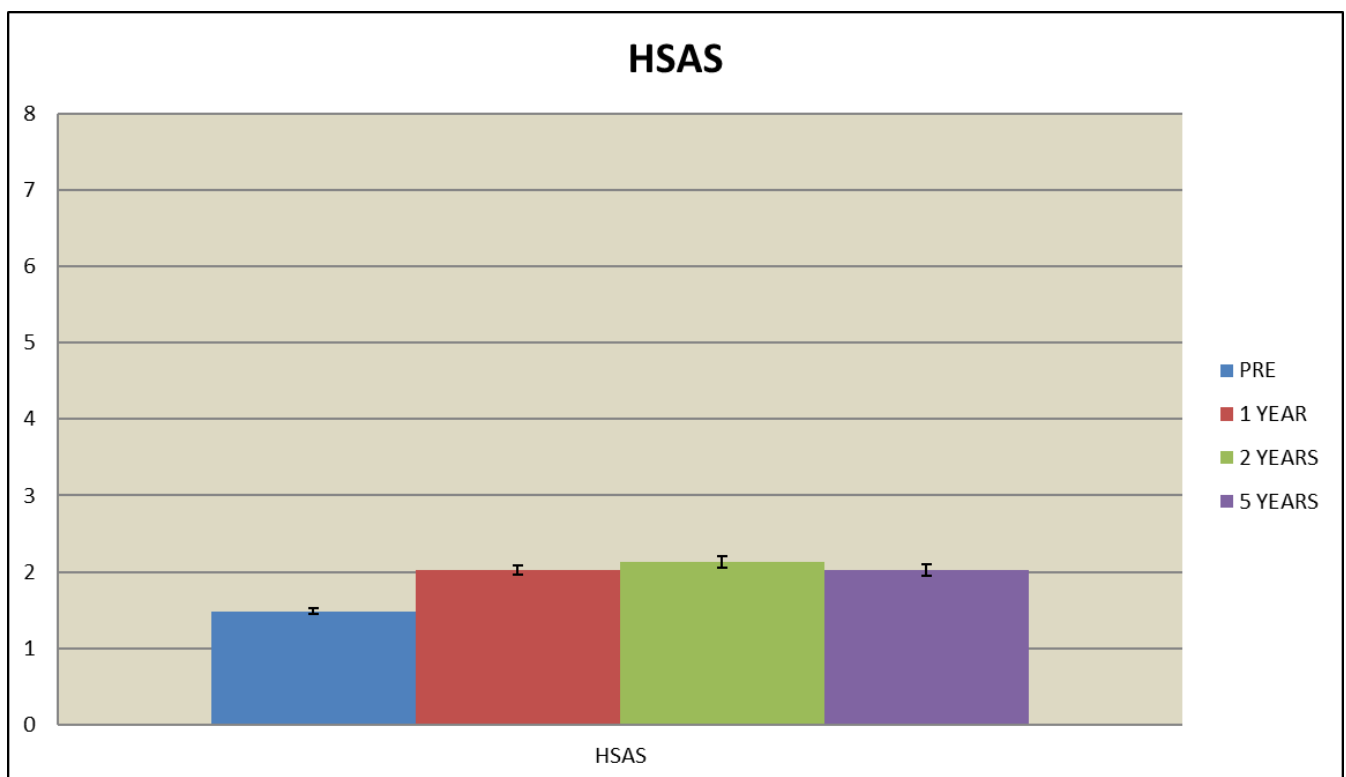
**Fig. 5.** EQ5D outcome data at 1, 2 and 5 years compared to the pre-scores.



### HSAS score (Hip Sports Activity Score)

**Table 22.** Patient assessed sports activity score, specific for hip related activities.

HSAS	2012-2019	2020	2021	2022	Mean (95% CI)
Pre	1.5	1.6	1.3	1.6	1.5 (1.42 - 1.54)
1 year	2.0	1.9	2.1	-	2.0 (1.96 – 2.09)
2 years	3.1	2.2	-	-	2.1 (2.05 – 2.21)
5 years	2.0	-	-	-	2.0 (1.91 – 2.13)



**Fig. 6.** HSAS outcome data at 1, 2 and 5 years compared to the pre-scores

**MCID**

**Table 23.** This shows the percentage of patients that reach the Minimal Clinical Important Difference (MCID) at follow-ups compared to baseline data. MCID is calculated from baseline data (SD/2).

<b>%</b>	<b>1 Year</b>	<b>2 Years</b>	<b>5 Years</b>
<b>HAGOS</b>			
<b>Pain</b>	62	65	67
<b>Symptoms</b>	64	66	61
<b>ADL</b>	60	63	64
<b>Sport &amp; rec</b>	59	62	63
<b>PA</b>	47	52	57
<b>QOL</b>	60	65	70
<b>NRS – pain rest</b>	57	58	61
<b>NRS – pain walk</b>	59	62	65
<b>VAS – Hip function overall</b>	67	67	68
<b>EQ5D</b>	44	47	51
<b>HSAS</b>	41	42	43
<b>iHOT<sub>12</sub></b>	67	69	-

## Sub analyses on Outcome Data

### HAGOS Age Related data

#### Comments:

2-year data:

Age group related PROM data demonstrated in the previous years in all subjective outcomes a significantly better result in the below 25 years of age group compared to the two older age groups (25-39 years and  $\geq 40$  years respectively).

5-year data:

The PROM results seems to have improved slightly for all age groups, and the young age group has improved slightly more than the two older groups.

We only present the 5-year tables, but have kept the 2-year diagrams for comparison.

**Table 24.** Comparison of HAGOS scores for 3 different age groups at 5 years.

Age <25 years (n=242 (27%)) (PROMS 5 years)	2012-2015	2016	2017	Mean
HAGOS				
Pain	77.4	75.4	77.7	76.8 (73.9 – 79.7)
Symptoms	66.5	64.7	67.4	66.1 (63.1 – 69.2)
ADL	80.4	81.0	81.4	80.4 (77.3 – 83.5)
Sport & rec	66.8	66.0	62.3	65.6 (61.6 – 69.7)
PA	57.5	56.5	52.9	56.3 (51.4 – 61.2)
QOL	59.8	59.6	58.5	59.2 (55.4 – 63.19)

Age 25-39 years (n=439 (29%)) (PROMS 5 years)	2012-2015	2016	2017	Mean
HAGOS				
Pain	73.4	73.6	69.8	72.9 (70.5 – 75.3)
Symptoms	66.9	67.0	60.5	65.9 (63.5 – 68.3)
ADL	75.4	76.4	73.6	76.1 (73.5 – 78.7)
Sport & rec	60.2	62.0	57.9	60.3 (57.2 – 63.3)
PA	48.6	53.5	48.1	49.7 (45.9 – 53.4)
QOL	57.9	58.8	52.4	57.3 (54.4 – 60.2)



<b>Age <math>\geq</math>40 years (n=738 (36%)) (PROMS 5 years)</b>	<b>2012-2015</b>	<b>2016</b>	<b>2017</b>	<b>Mean</b>
HAGOS				
Pain	<b>71.2</b>	<b>73.9</b>	<b>71.2</b>	<b>71.7 (69.8 – 73.6)</b>
Symptoms	<b>67.9</b>	<b>71.7</b>	<b>68.5</b>	<b>68.8 (67.0 – 70.5)</b>
ADL	<b>71.8</b>	<b>76.2</b>	<b>72.0</b>	<b>72.6 (70.6 – 74.7)</b>
Sport & rec	<b>58.1</b>	<b>65.0</b>	<b>58.5</b>	<b>59.5 (57.0 – 61.9)</b>
PA	<b>50.8</b>	<b>53.1</b>	<b>50.1</b>	<b>51.2 (48.3 – 54.1)</b>
QOL	<b>57.0</b>	<b>60.6</b>	<b>56.7</b>	<b>57.7 (55.5 – 59.9)</b>



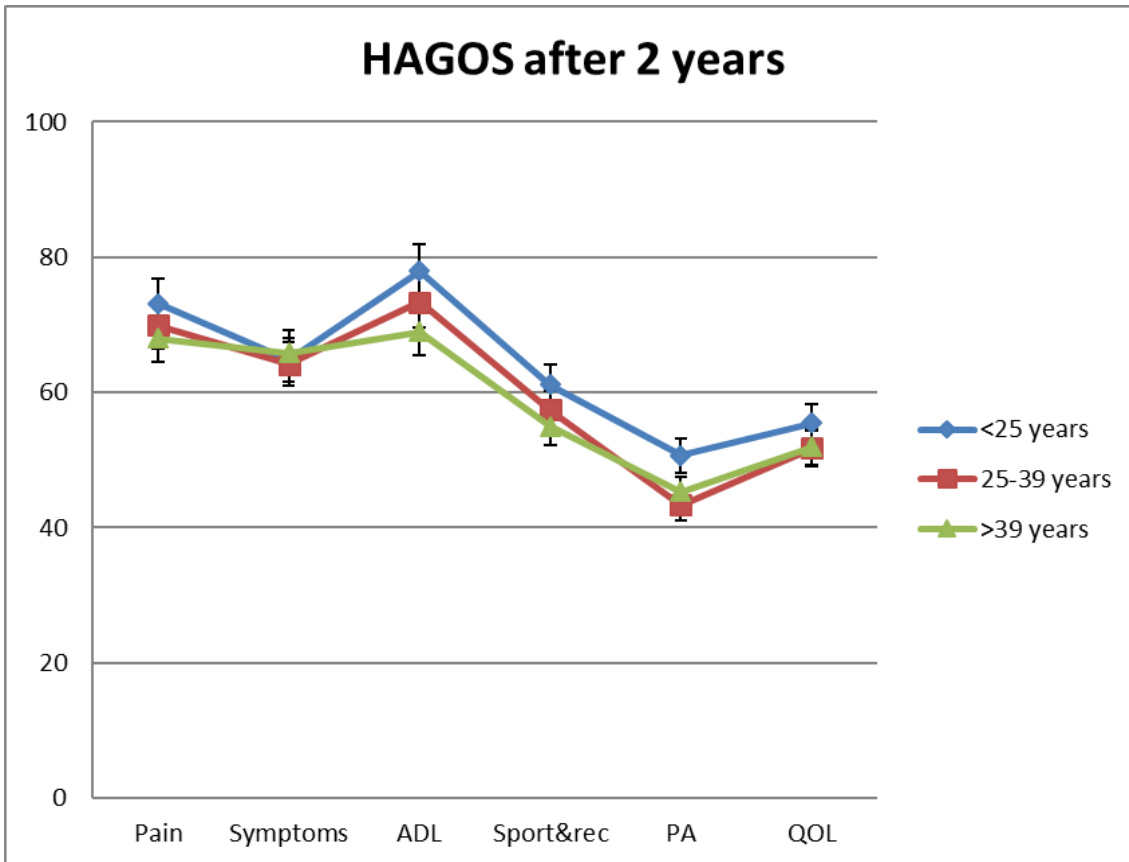


Fig. 7. HAGOS data at 2 years. Comparison of the 3 age groups.

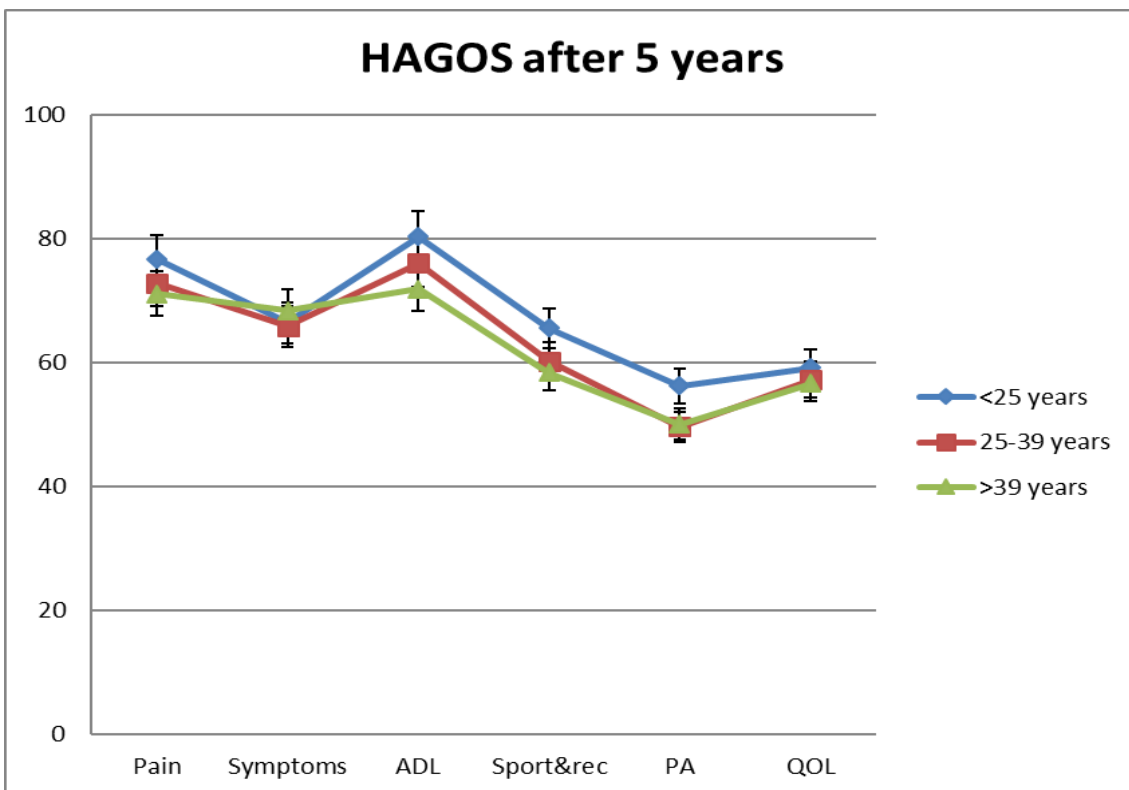
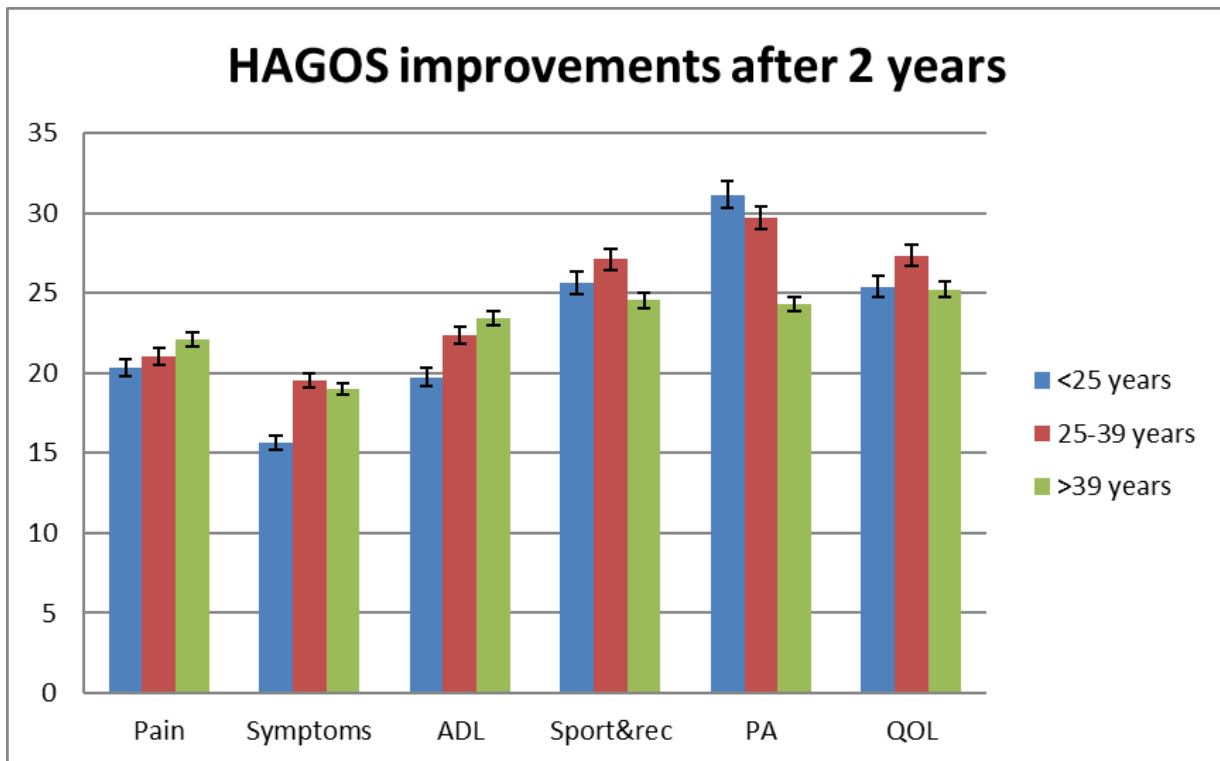
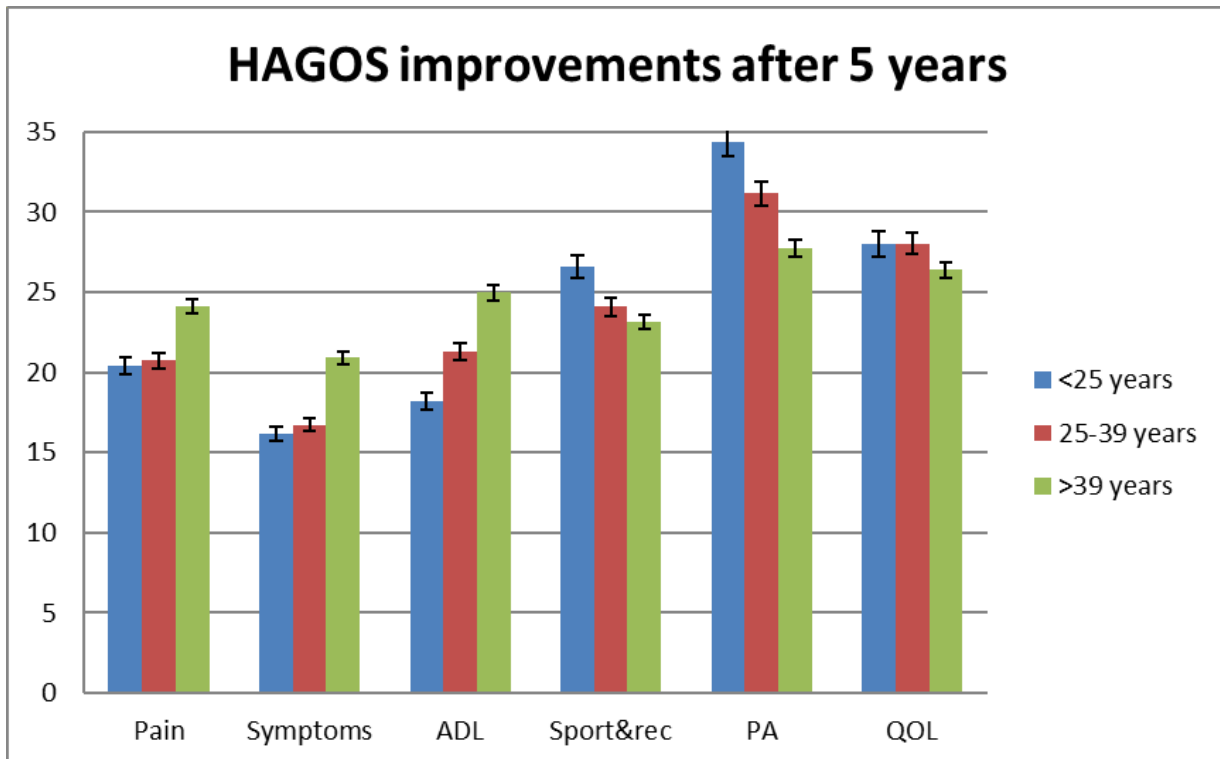


Fig. 8. HAGOS data at 5 years. Comparison of the 3 age groups



**Fig. 9.** The improvements in HAGOS points (0-100) from baseline to 2 years postop.



**Fig. 10.** The improvements in HAGOS points (0-100) from baseline to 5 years postop.

## HAGOS data at 2 years and 5 years related to cartilage lesions found during surgery.

### Comments:

Because of the small numbers in some of the groups it is not possible to make reliable diagrams that show combinations of all the different sizes and grades of cartilage lesions. Therefore, we show two simplified diagrams that shows the important tendencies. The grade of acetabular cartilage lesions seen at surgery seems only to be of significance for the large size lesions in the acetabulum on the HAGOS results after 2 years. The size alone seems also to be of significance, since the large size lesions (>2 cm<sup>2</sup>) have worse results than all the others, and there is no difference between the small and middle size lesions.

The size of the lesions on the femoral head does not have much significance since any size lesions have impaired results but worse results are seen for the large lesions in the physically demanding items in HAGOS.

Preoperative patient selection seems to work since only very few patients with severe cartilage lesions have had an arthroscopic procedure.

In this section we only show the tables for the 5-year outcomes but have kept the diagrams for both the 2-year as well as the 5-year outcomes for comparison.

**Table 25.** Comparisons of 5-year data for HAGOS and different grades and sizes of cartilage lesions in the acetabulum. Be aware of the small numbers in some of the tables.

Beck gr. 2 / 1-2cm <sup>2</sup> (n=289 (32%))	2012-2015	2016	2017	Mean
<b>HAGOS</b>	n=(190)	(n=63)	(n=36)	
Pain	<b>73.4</b>	<b>78.6</b>	<b>69.7</b>	<b>74.0 (70.9 – 77.2)</b>
Symptoms	<b>67.7</b>	<b>74.8</b>	<b>67.3</b>	<b>69.2 (66.3– 72.1)</b>
ADL	<b>75.2</b>	<b>81.7</b>	<b>71.4</b>	<b>76.1 (72.8 – 79.4)</b>
Sport & rec	<b>62.4</b>	<b>69.6</b>	<b>57.6</b>	<b>63.4 (59.4 – 67.4)</b>
PA	<b>51.6</b>	<b>60.7</b>	<b>47.9</b>	<b>53.1 (48.3 – 57.9)</b>
QOL	<b>59.1</b>	<b>67.7</b>	<b>54.6</b>	<b>60.4 (56.8 – 64.0)</b>

Beck gr. 2 / >2cm <sup>2</sup> (n=19 (26%))	2012-2015	2016	2017	Mean
<b>HAGOS</b>	(n=12)	(n=3)	(n=4)	
Pain	<b>53.8</b>	<b>62.5</b>	<b>73.1</b>	<b>59.2 (44.6 – 73.8)</b>
Symptoms	<b>57.1</b>	<b>61.9</b>	<b>67.9</b>	<b>60.2 (47.7 – 72.6)</b>
ADL	<b>52.1</b>	<b>70.0</b>	<b>78.8</b>	<b>60.5 (44.1 – 76.9)</b>
Sport & rec	<b>38.3</b>	<b>60.4</b>	<b>55.5</b>	<b>45.4 (26.6 – 64.2)</b>
PA	<b>43.8</b>	<b>37.5</b>	<b>68.8</b>	<b>48.0 (29.7 – 66.3)</b>
QOL	<b>49.2</b>	<b>51.7</b>	<b>61.3</b>	<b>52.1 (39.1 – 65.1)</b>



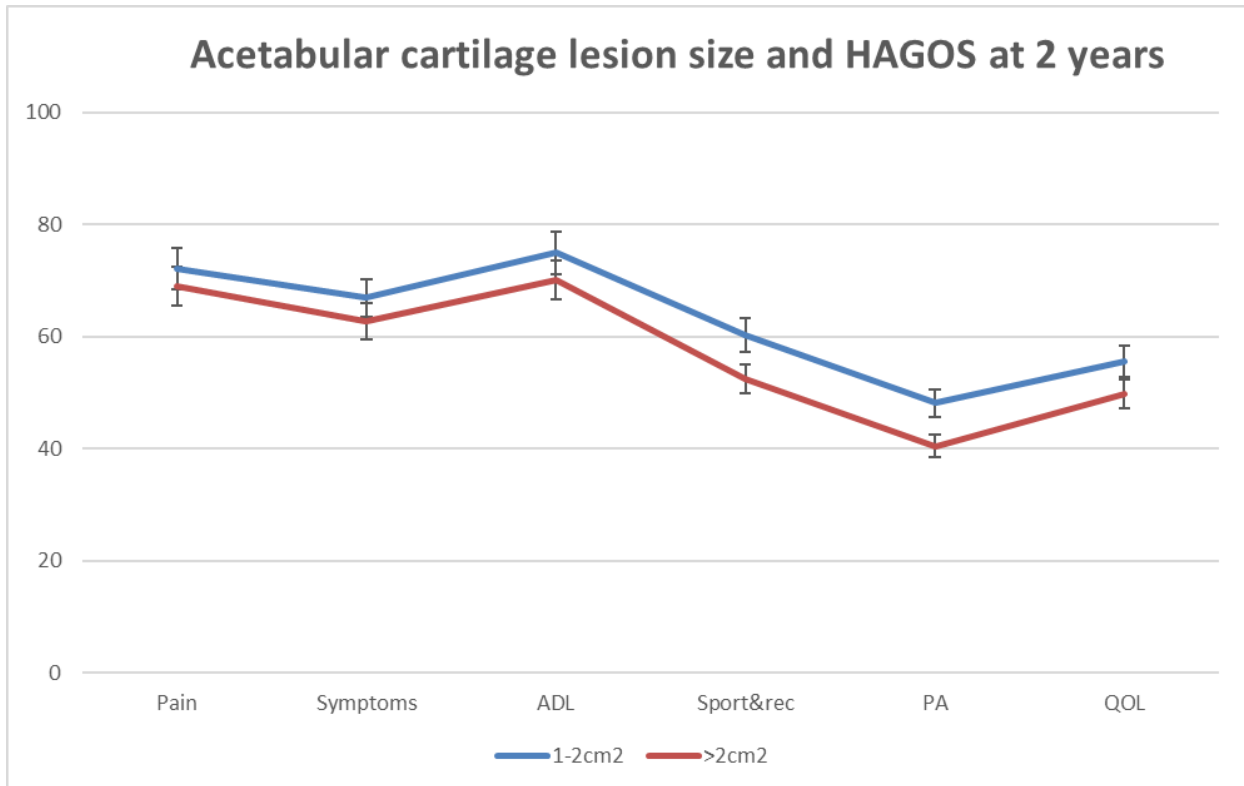
Beck gr. 3 / 1-2cm <sup>2</sup> (n=217 (32%))	2012-2015	2016	2017	Mean
<b>HAGOS</b>	(n=155)	(n=31)	(n=31)	
Pain	<b>74.7</b>	<b>78.4</b>	<b>76.5</b>	<b>75.5 (72.4 – 78.5)</b>
Symptoms	<b>67.2</b>	<b>71.7</b>	<b>68.2</b>	<b>68.0 (64.7 – 71.2)</b>
ADL	<b>76.7</b>	<b>80.0</b>	<b>81.1</b>	<b>77.8 (74.5 – 81.1)</b>
Sport & rec	<b>61.0</b>	<b>67.1</b>	<b>64.6</b>	<b>62.4 (58.2 – 66.6)</b>
PA	<b>49.1</b>	<b>48.8</b>	<b>52.0</b>	<b>49.5 (44.1 – 54.9)</b>
QOL	<b>58.2</b>	<b>61.1</b>	<b>60.6</b>	<b>58.9 (55.1 – 62.8)</b>

Beck gr. 3 / >2cm <sup>2</sup> (n=45 (29%))	2012-2015	2016	2017	Mean
<b>HAGOS</b>	(n=28)	(n=7)	(n=10)	
Pain	<b>77.3</b>	<b>58.6</b>	<b>66.5</b>	<b>72.0 (64.5 – 79.5)</b>
Symptoms	<b>73.3</b>	<b>53.1</b>	<b>62.1</b>	<b>67.7 (60.6 – 74.8)</b>
ADL	<b>79.3</b>	<b>57.9</b>	<b>73.0</b>	<b>74.6 (66.1 – 83.0)</b>
Sport & rec	<b>64.2</b>	<b>42.0</b>	<b>57.8</b>	<b>59.3 (49.6 – 69.0)</b>
PA	<b>53.1</b>	<b>46.4</b>	<b>41.3</b>	<b>49.4 (37.8 – 61.1)</b>
QOL	<b>58.6</b>	<b>37.1</b>	<b>53.0</b>	<b>54.0 (44.7 – 63.3)</b>

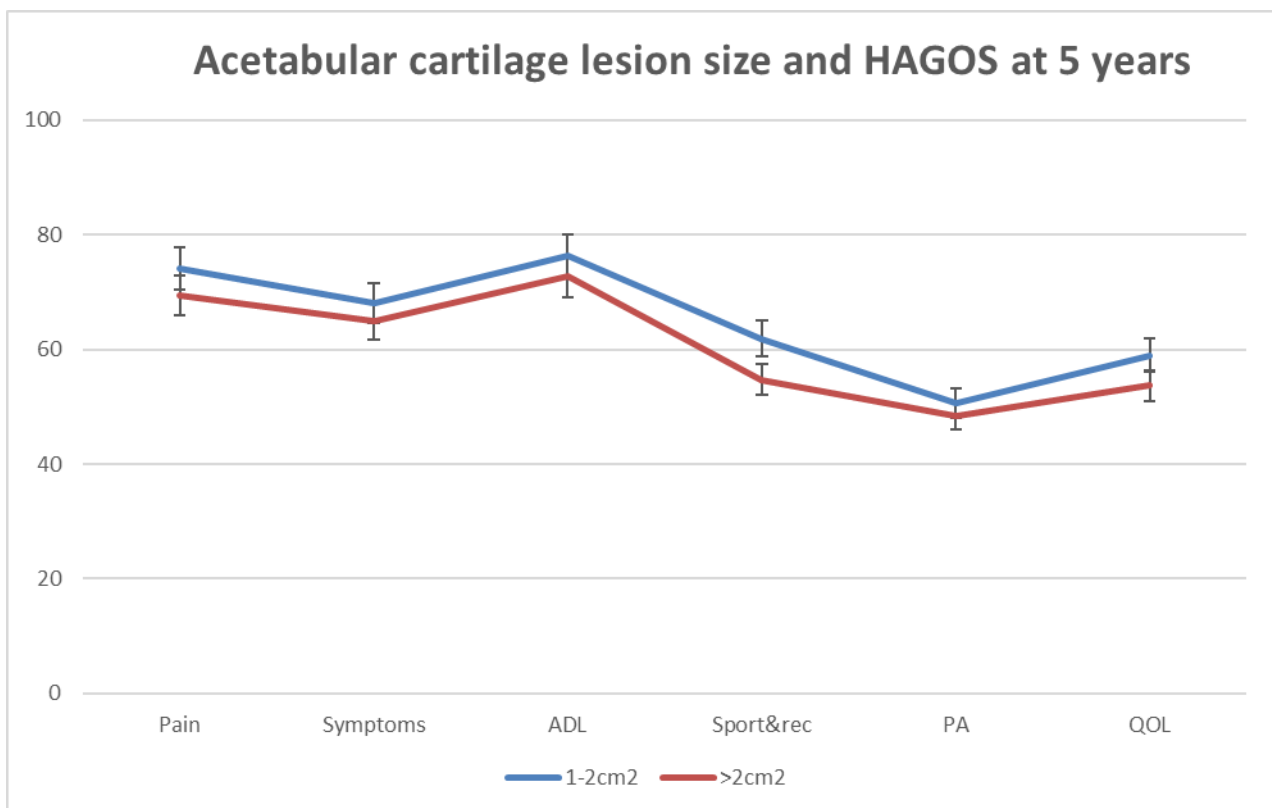
Beck gr. 4 / 1-2cm <sup>2</sup> (n=62 (35%))	2012-2015	2016	2017	Mean
<b>HAGOS</b>	(n=39)	(n=16)	(n=7)	
Pain	<b>68.7</b>	<b>70.9</b>	<b>68.2</b>	<b>69.2 (62.4 – 76.0)</b>
Symptoms	<b>63.5</b>	<b>62.7</b>	<b>65.3</b>	<b>63.5 (56.5 – 70.5)</b>
ADL	<b>70.4</b>	<b>73.8</b>	<b>70.7</b>	<b>71.3 (63.5 – 79.1)</b>
Sport & rec	<b>49.7</b>	<b>56.8</b>	<b>63.8</b>	<b>53.1 (44.2 – 62.1)</b>
PA	<b>38.1</b>	<b>50.0</b>	<b>53.6</b>	<b>42.9 (33.2 – 52.7)</b>
QOL	<b>49.7</b>	<b>55.9</b>	<b>59.3</b>	<b>52.4 (44.6 – 60.3)</b>



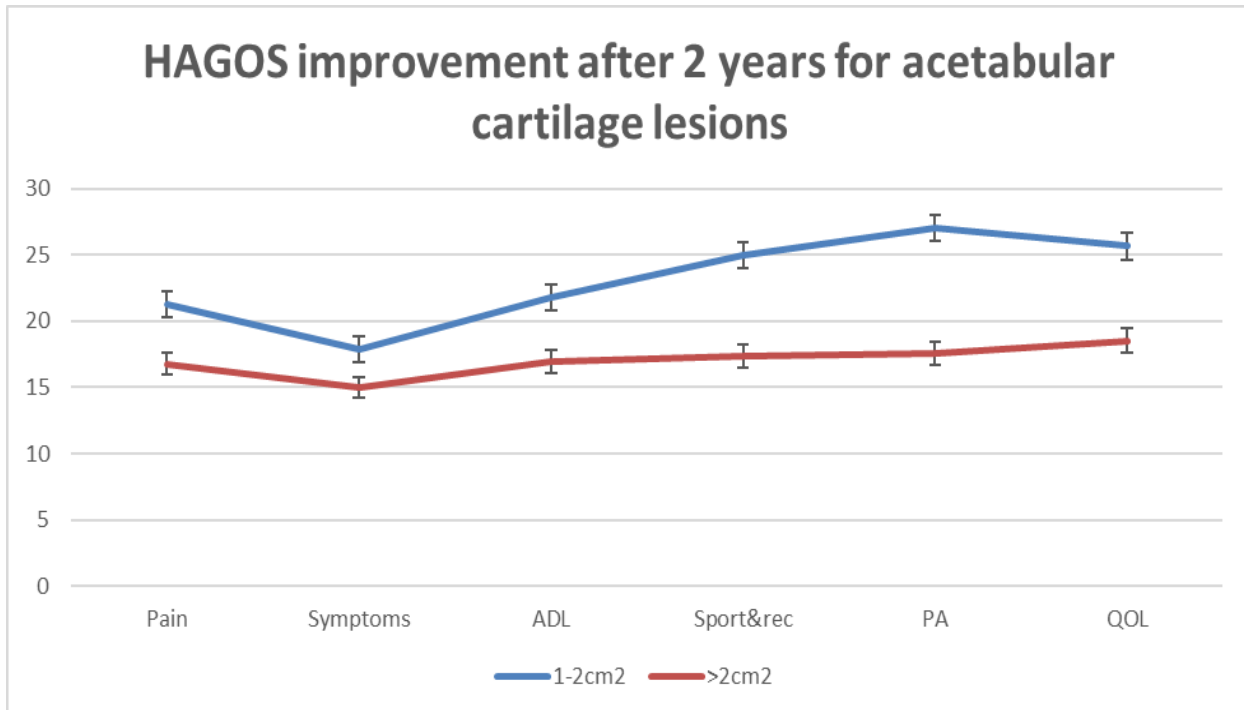
<b>Beck gr. 4 / &gt;2cm<sup>2</sup> (n=54 (25%))</b>	<b>2012-2015</b>	<b>2016</b>	<b>2017</b>	<b>Mean</b>
<b>HAGOS</b>	(n=41)	(n=10)	(n=3)	
Pain	<b>70.3</b>	<b>72.5</b>	<b>76.7</b>	<b>71.1 (64.4 – 77.8)</b>
Symptoms	<b>64.2</b>	<b>66.4</b>	<b>58.3</b>	<b>64.3 (57.8 – 70.7)</b>
ADL	<b>75.0</b>	<b>76.0</b>	<b>81.7</b>	<b>75.6 (68.8 – 82.3)</b>
Sport & rec	<b>52.6</b>	<b>61.3</b>	<b>57.3</b>	<b>54.5 (45.2 – 63.7)</b>
PA	<b>44.8</b>	<b>62.5</b>	<b>50.0</b>	<b>48.8 (37.7 – 59.1)</b>
QOL	<b>53.3</b>	<b>59.5</b>	<b>46.7</b>	<b>54.1 (46.5 – 61.7)</b>



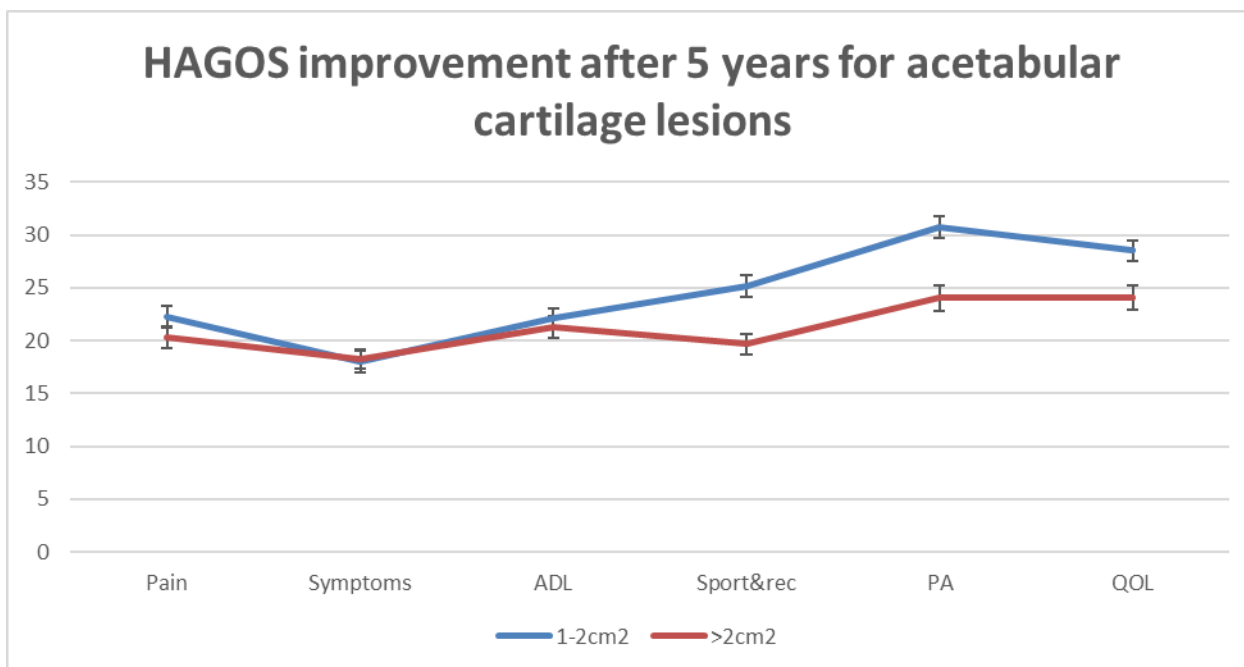
**Fig. 11.** HAGOS results for Beck grade 2-4 cartilage lesions. Only the large size lesion seems to affect the results.



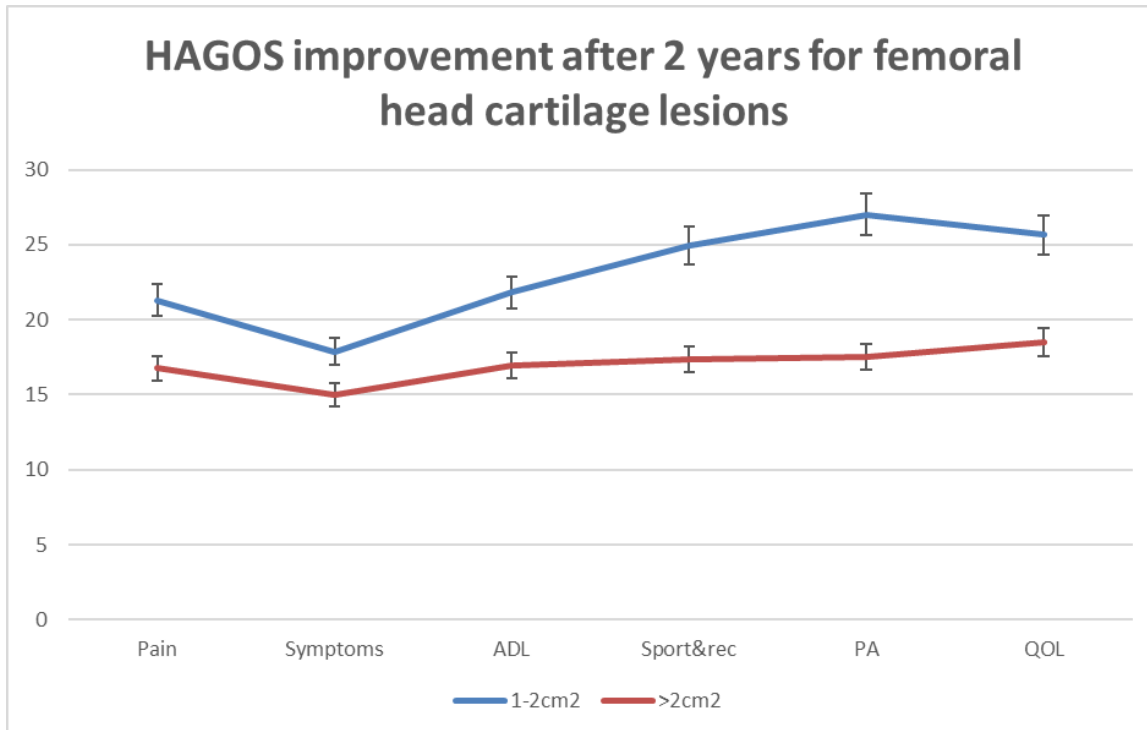
**Fig. 12.** HAGOS results for Beck grade 2-4 cartilage lesions. Only the large size lesion seems to affect the results. The difference seems to be rather small, and acetabular cartilage lesions probably doesn't affect the results much.



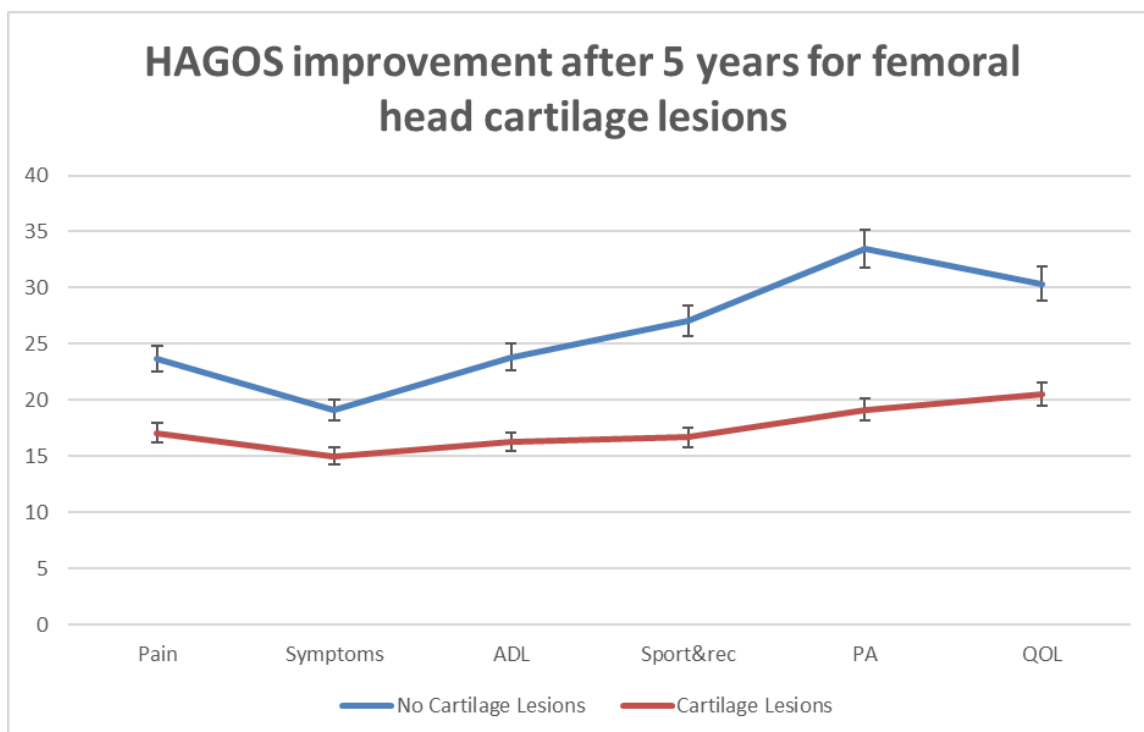
**Fig. 13.** Difference in HAGOS improvements at 2 years between large and smaller size cartilage lesions in the acetabulum irrespective of the grade. Only the large size lesions seem to differ from the others, and for simplicity all the smaller sizes have been pooled to one line.



**Fig. 14.** Difference in HAGOS improvements at 5 years between large and smaller size cartilage lesions in the acetabulum irrespective of the grade. Only the large size lesions seem to differ from the others, and for simplicity all the smaller sizes have been pooled to one line. However, the results have improved for both groups since the 2-year results.

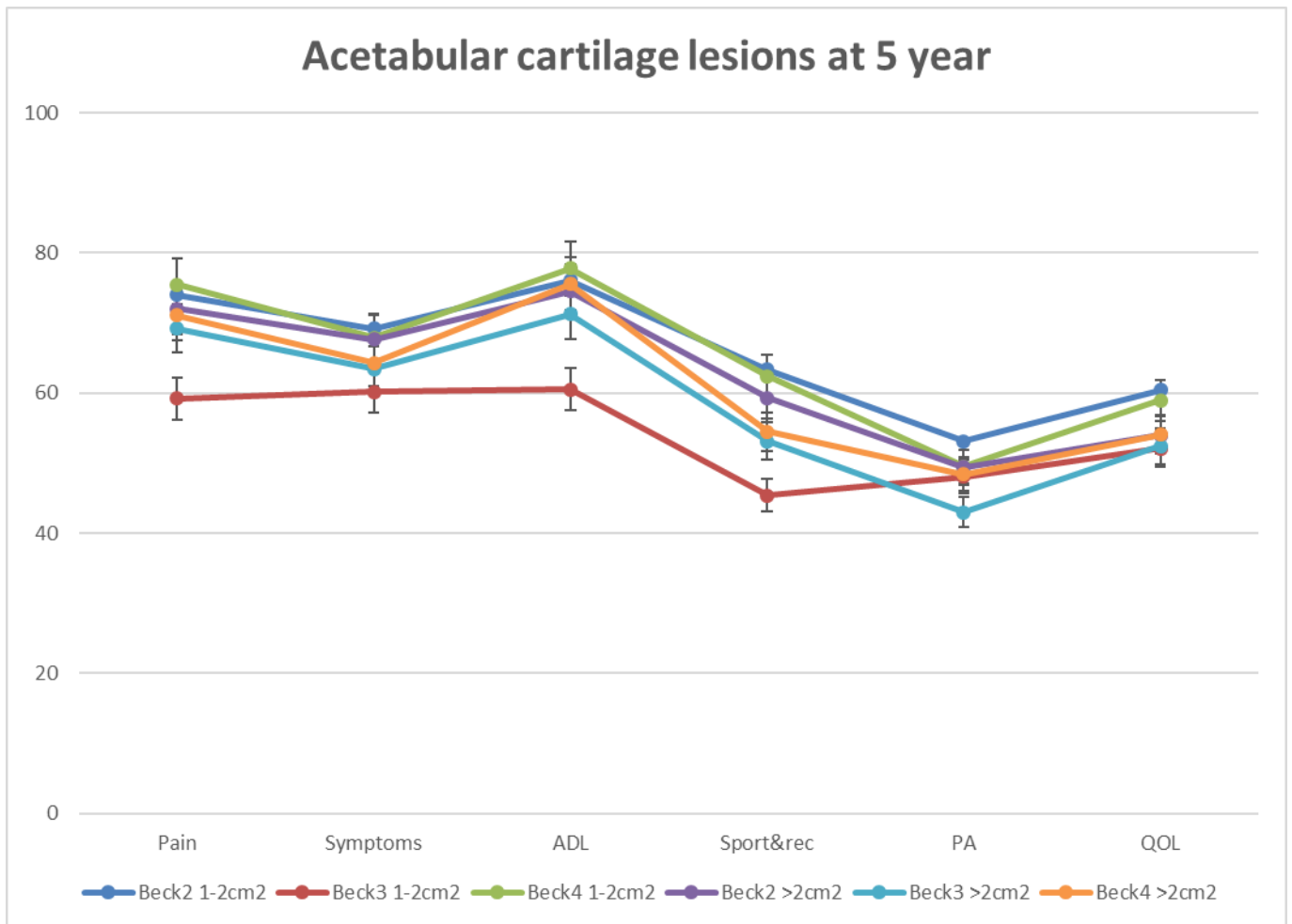


**Fig. 15.** Difference in HAGOS improvements at 2 years between any size cartilage lesion and no cartilage lesion at all on the femoral head irrespective of the grade. Any cartilage lesion size on the femoral head seem to differ from no lesion.



**Fig. 16.** Difference in HAGOS improvements at 5 years between any size cartilage lesion and no cartilage lesion at all on the femoral head irrespective of the grade. Any cartilage lesion size on the femoral head seem to differ from no lesion. The results of the “no cartilage lesion” group have improved further for the physically demanding activities and QoL since the 2-year results. It seems that results are improving further from 2-year to 5-year.





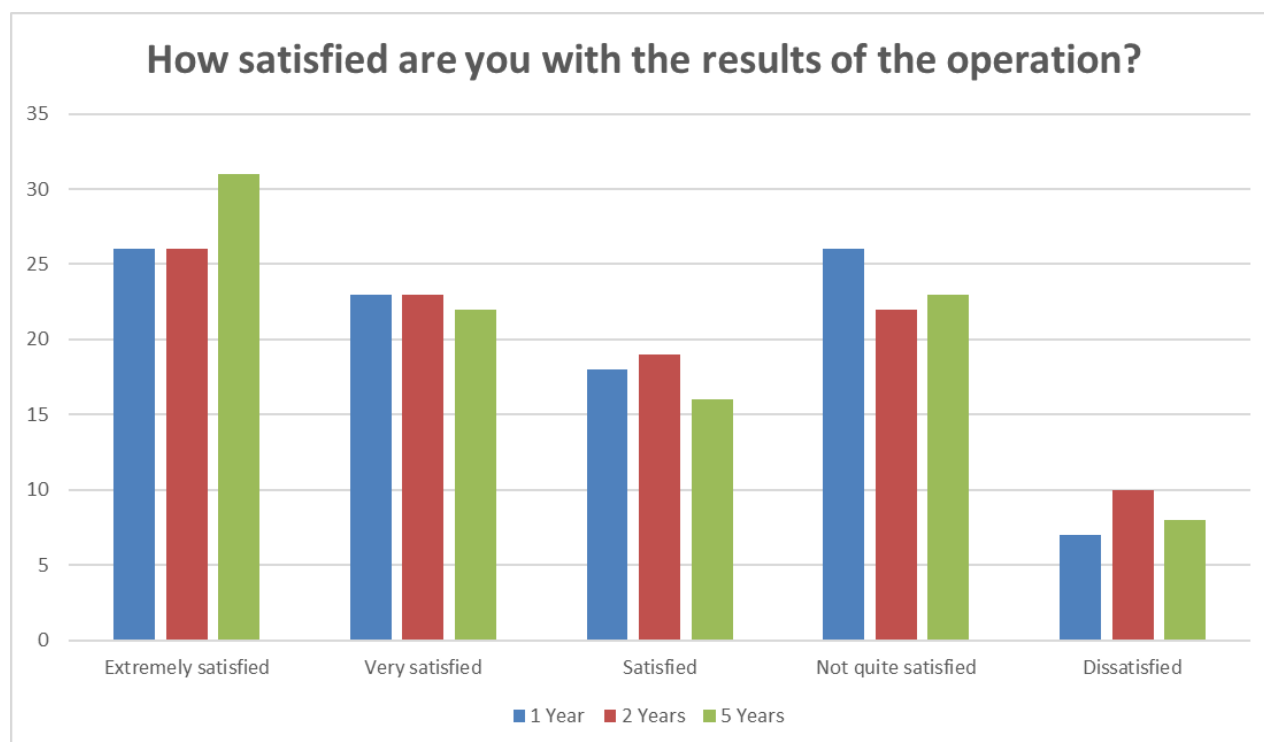
**Fig. 17.** The medium size grade 2 and 3 lesions have better results than all the large size lesions and the medium size grade 4 lesions. The worst results are seen in the large grade 4 lesions. The data for the largest size lesions are based on very few numbers and should be read cautiously and especially for the Beck2 >2cm2 (see table 25).

## Supplementary questions

A new feature in DHAR since the 2021 Annual Report is the implementation of a series of patient related questions regarding persisting symptoms related to the surgery and satisfaction and willingness to repeat the surgery.

**Table 26.** How satisfied are you with the result of the operation?

N (%)	1 year	2 years	5 years
Extremely satisfied	255 (26)	224 (26)	211 (31)
Very satisfied	223 (23)	198 (23)	151 (22)
Satisfied	175 (18)	163 (19)	111 (16)
Not quite satisfied	253 (26)	191 (22)	156 (23)
Dissatisfied	78 (7)	86 (10)	57 (8)
<b>Total</b>	<b>981 (100)</b>	<b>862 (100)</b>	<b>686 (100)</b>

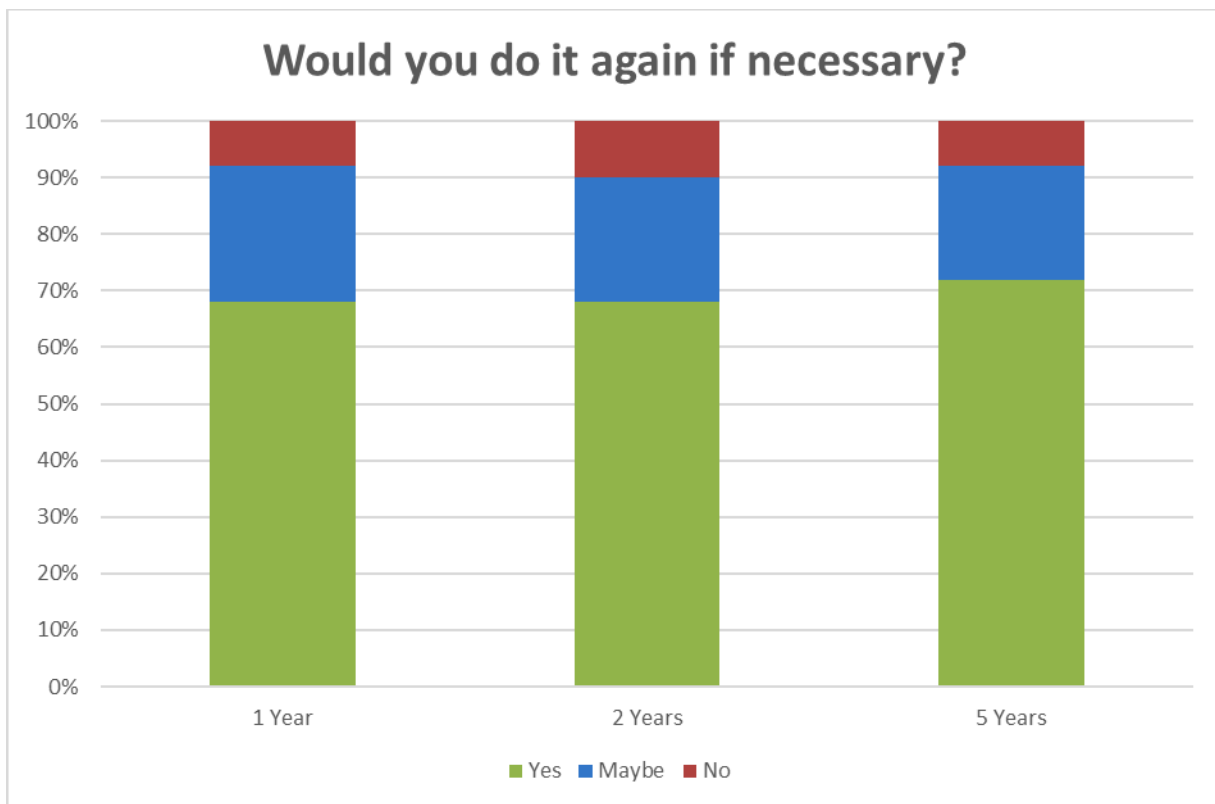


**Fig. 18.** Overall satisfaction is around 70%.



**Table 27.** Would you do it again if necessary?

N (%)	1 year	2 years	5 years
Yes	664 (68)	587 (68)	494 (72)
Maybe	239 (24)	191 (22)	138 (20)
No	78 (8)	84 (10)	54 (8)
<b>Total</b>	<b>981 (100)</b>	<b>644 (100)</b>	<b>686 (100)</b>



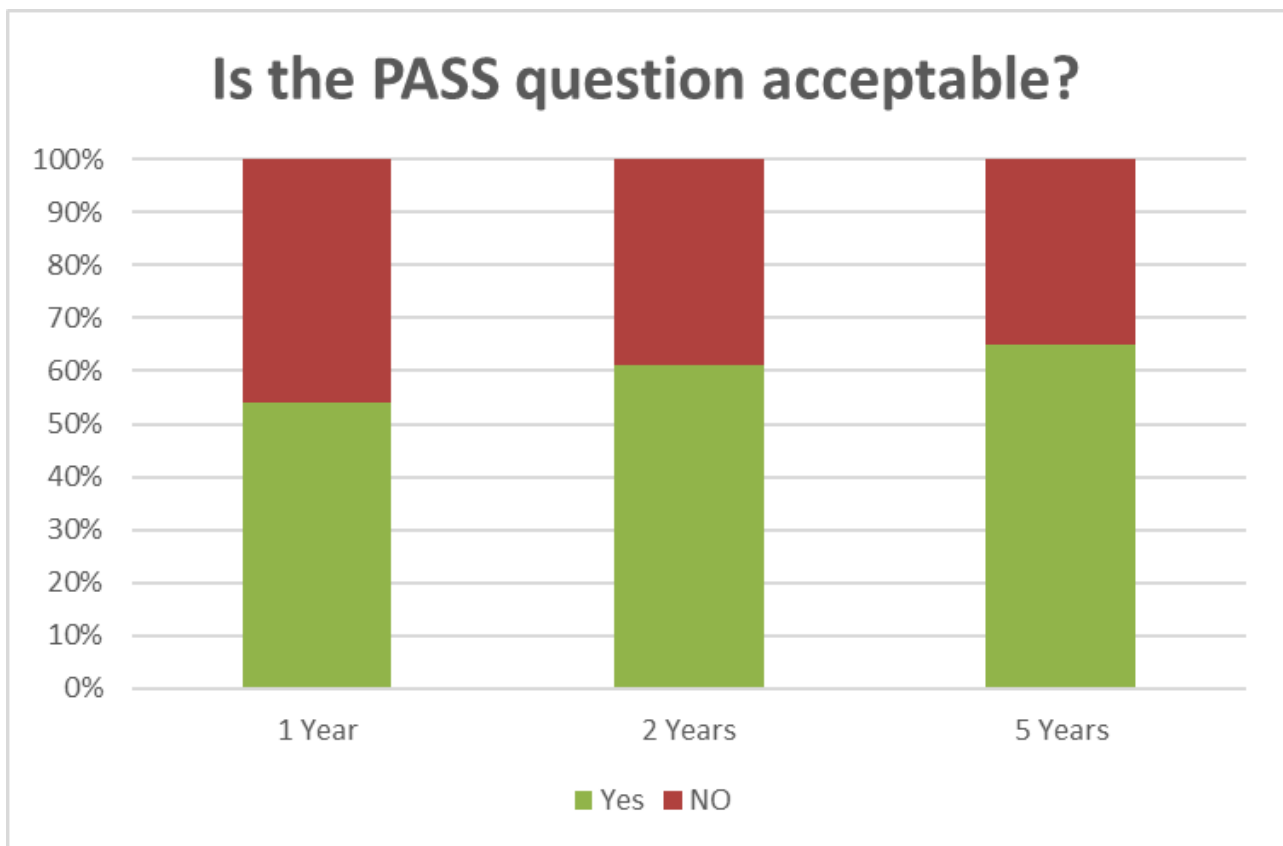
**Fig. 19.** Willingness to repeat surgery is around 70 %.



**Table 28. PASS (Patient Acceptable Symptom State)**

“If you think of your hip- and groin pain in the past week and how it affects your daily life, do you then think your symptoms are acceptable as they are now if they stay the same for the rest of your life? If you have pain in both hips, try to answer for the hip that has been operated.”

N (%)	1 year	2 years	5 years
Yes	525 (54)	525 (61)	443 (65)
No	456 (46)	337 (39)	243 (35)
<b>Total</b>	<b>981 (100)</b>	<b>862 (100)</b>	<b>686 (100)</b>



**Fig. 20.** PASS question.



Table 29. What is your exercise/physical activity level now?

N (%)	1 year	2 years	5 years
Higher level than before start of symptoms	111 (11)	78 (9)	70 (10)
Same level as before start of symptoms	176 (18)	152 (18)	132 (19)
Lower level due to the hip	464 (47)	394 (46)	322 (47)
Lower level, but not because of the hip	62 (6)	72 (8)	68 (10)
Stopped with activity because of hip	132 (14)	123 (14)	60 (9)
Stopped with activities, but not because of the hip	17 (2)	14 (2)	19 (3)
Does not exercise/no physical activities	19 (2)	29 (3)	15 (2)
<b>Total</b>	<b>981 (100)</b>	<b>862 (100)</b>	<b>686 (100)</b>

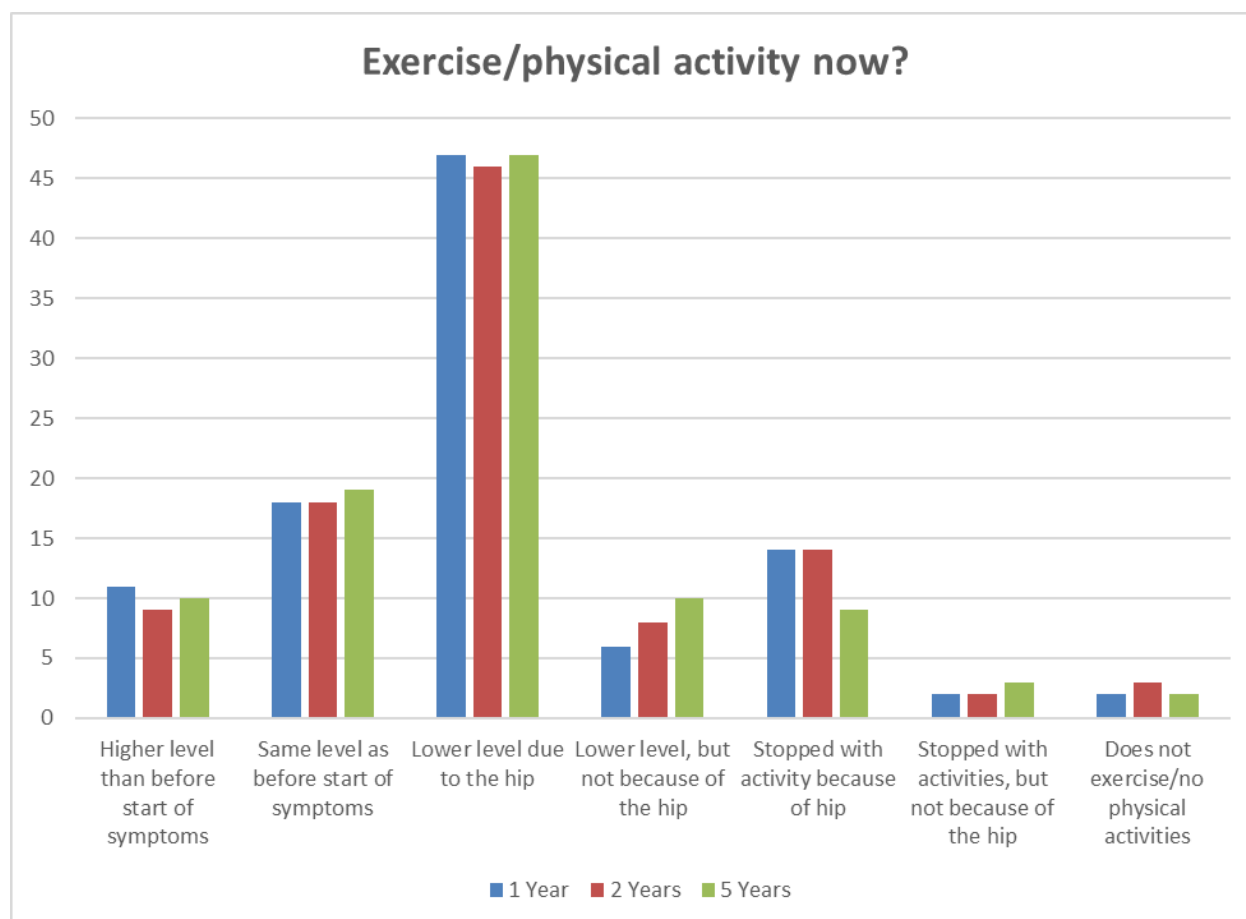
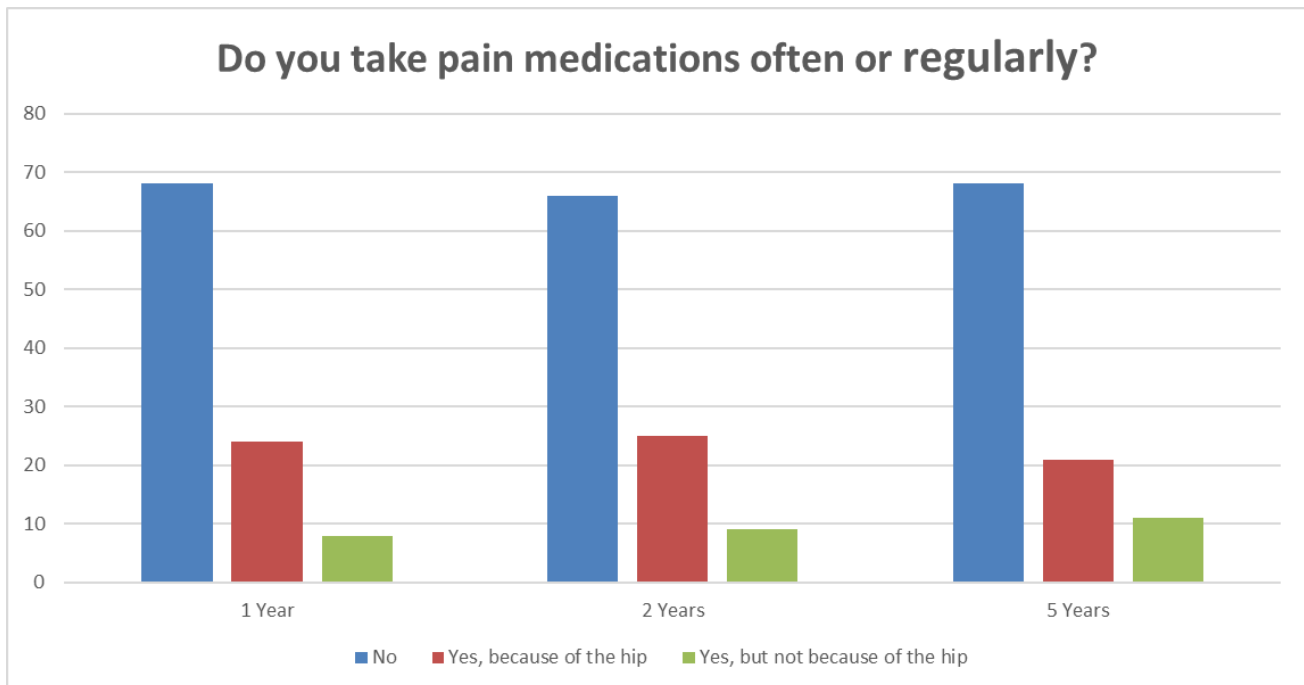


Fig. 21. Activity levels in percent after hip arthroscopy. It seems that a little more than half of the patients have decreased activity levels due to the affected hip and that this seems to be consistent over time.



**Table 30.** Do you take pain medications often or regularly?

N (%)	1 year	2 years	5 years
No	669 (68)	571 (66)	465 (68)
Yes, because of the hip	239 (24)	214 (25)	145 (21)
Yes, but not because of the hip	73 (8)	77 (9)	76 (11)
<b>Total</b>	<b>981 (100)</b>	<b>862 (100)</b>	<b>686 (100)</b>



**Fig. 22.** Around 75 % of patients do not take pain medications regularly, due to the hip.



Table 31: Complications

N (%)	1 year	2 years	5 years
None	553 (56)	490 (57)	389 (58)
Persistent numbness/loss of sensation in the skin on the outside of upper thigh (more than one palm size area)	141 (14)	104 (12)	74 (11)
Persistent numbness/loss of sensation in the perineal area	8 (1)	12 (2)	8 (1)
Persistent numbness/loss of sensation on the foot	27 (3)	21 (2)	16 (2)
Problems with erectile dysfunction after the operation	5 (1)	8 (1)	3 (0)
Venous thrombosis treatment/Pulmonary embolisms	1 (0)	2 (0)	2 (0)
Other (pain, osteoarthritis, severe stiffness)	246 (25)	225 (26)	194 (26)
<b>Total</b>	<b>981 (100)</b>	<b>862 (100)</b>	<b>686 (100)</b>

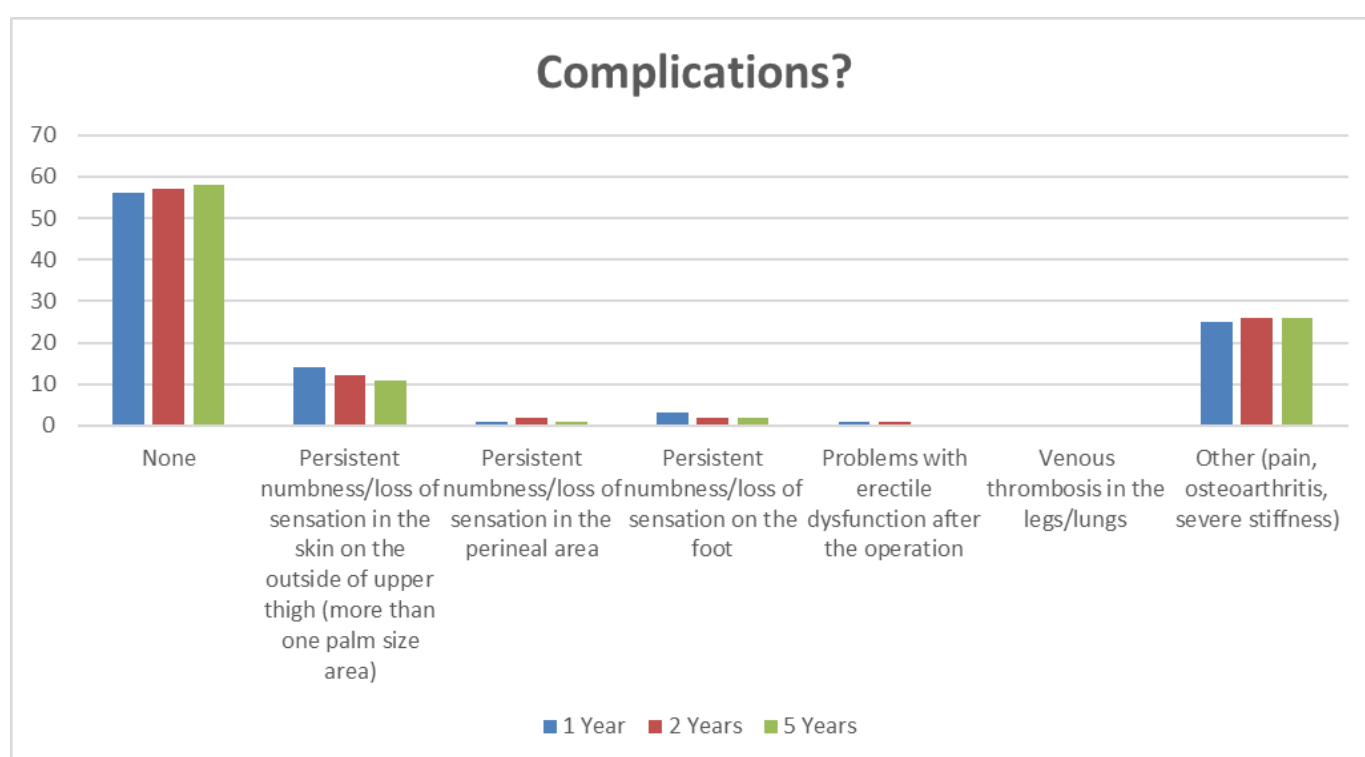


Fig. 23. Approximately 10 % of patients have persistent numbness at the LCFN, and 1 % in the perineal area.

**Sport questions.**

We have also added questions about type of sports prior to surgery. So far **2648** patients have entered data on sports.

**Table 32: Sport**

<b>Sport prior to surgery</b>	<b>N (%)</b>
Soccer	400 (15)
Fitness	350 (13)
Cycling	220 (8)
Running	207 (8)
Equestrian sport	177 (7)
Team handball	128 (5)
Martial arts	91 (3)
Gymnastics	67 (3)
Badminton	59 (2)
Golf	38 (1)
Dancing	34 (1)
Ice hockey	22 (1)
Tennis	16 (1)
Basketball	8 (0)
Other sports	669 (25)
No Sports	162 (6)



## Revision arthroscopies

### PROMs for revision arthroscopies

#### Comments:

These data show the same improvement tendencies in HAGOS results as for primary hip-arthroscopies, but the improvements are lower (figure 19). This would be expected, but it has not been shown previously in DHAR.

The negative results seen in figure 20 shows, that the results after re-arthroscopies are less good than after primary arthroscopies. This is most pronounced in the physically demanding activities where the difference is exceeding the MCID for primary arthroscopies. At 5 years there seems to be a markedly improvement in the non-physical activities, but the results are still at a lower level than after primary hip arthroscopies.

**Table 33.** Development of PROM results over time for revision arthroscopies and the mean results after 1, 2 and 5 years.

PROMS pre (n=511 (48%))	2012-2019	2020	2021	2022	Mean (95% CI)
HAGOS					
Pain	44.9	46.4	45.6	45.1	45.1 (43.4 – 46.9)
Symptoms	42.2	43.7	42.6	42.8	42.4 (40.8 – 44.1)
ADL	44.6	52.1	49.6	51.1	46.4 (44.1 – 48.6)
Sport & rec	25.8	26.8	29.2	31.1	26.7 (24.6 – 28.7)
PA	15.3	13.4	15.6	17.3	15.3 (13.2 – 17.3)
QOL	23.9	26.6	22.0	24.4	24.1 (22.6 – 25.5)
iHOT <sub>12</sub>	30.5	36.0	31.1	33.6	32.6 (29.9 – 35.2)
NRS Pain - rest	45.0	36.9	42.8	44.1	43.9 (41.4 – 46.4)
NRS pain – walking 15 mins.	59.5	51.6	56.5	59.3	58.4 (55.8 – 61.0)
VAS – Hip function overall	34.1	37.7	34.2	31.5	34.3 (32.4 – 36.1)
EQ5D	0.59	0.66	0.60	0.63	0.60 (0.58 – 0.62)
HSAS	1.0	1.3	1.4	1.3	1.1 (0.9 – 1.2)



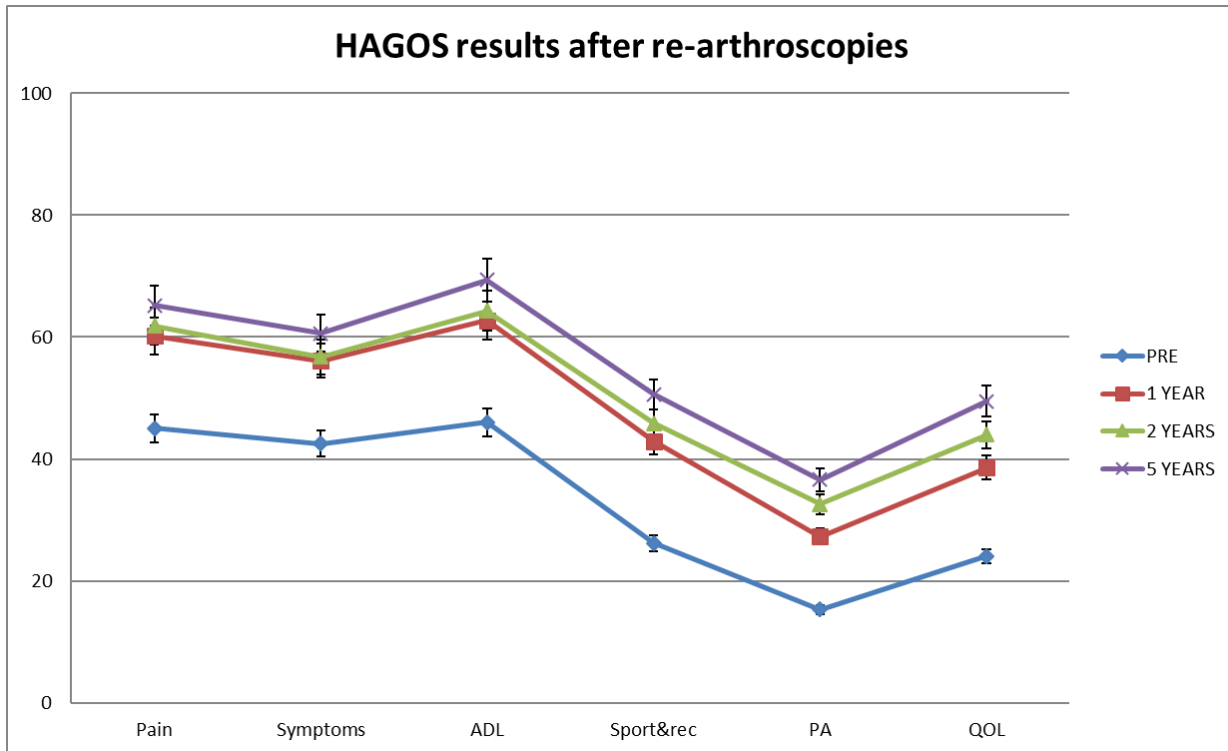
<b>PROMS 1 Year (n=474 (50%))</b>	<b>2012-2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>Mean (95% CI)</b>
HAGOS					
Pain	<b>60.1</b>	<b>62.4</b>	<b>64.2</b>	-	<b>60.6 (58.3 – 62.9)</b>
Symptoms	<b>55.7</b>	<b>57.4</b>	<b>58.7</b>	-	<b>56.1 (54.0 – 58.2)</b>
ADL	<b>62.4</b>	<b>67.3</b>	<b>69.1</b>	-	<b>63.4 (60.7 – 66.1)</b>
Sport & rec	<b>42.4</b>	<b>48.5</b>	<b>47.5</b>	-	<b>43.4 (40.6 – 46.3)</b>
PA	<b>27.4</b>	<b>26.8</b>	<b>29.5</b>	-	<b>27.5 (24.4 – 30.5)</b>
QOL	<b>38.6</b>	<b>39.0</b>	<b>42.9</b>	-	<b>38.9 (36.5 – 41.3)</b>
iHOT <sub>12</sub>	<b>55.4</b>	<b>51.4</b>	<b>49.8</b>	-	<b>53.6 (49.6 – 57.7)</b>
NRS Pain - rest	<b>28.3</b>	<b>25.5</b>	<b>29.4</b>	-	<b>28.0 (25.5 – 30.6)</b>
NRS pain – walking 15 mins.	<b>39.0</b>	<b>35.1</b>	<b>34.8</b>	-	<b>38.3 (35.2 – 41.3)</b>
VAS – Hip function overall	<b>54.9</b>	<b>59.2</b>	<b>53.3</b>	-	<b>55.2 (52.7 – 57.8)</b>
EQ5D	<b>0.69</b>	<b>0.73</b>	<b>0.71</b>	-	<b>0.70 (0.68 – 0.72)</b>
HSAS	<b>1.4</b>	<b>1.4</b>	<b>2.1</b>	-	<b>1,4 (1.3 – 1.6)</b>



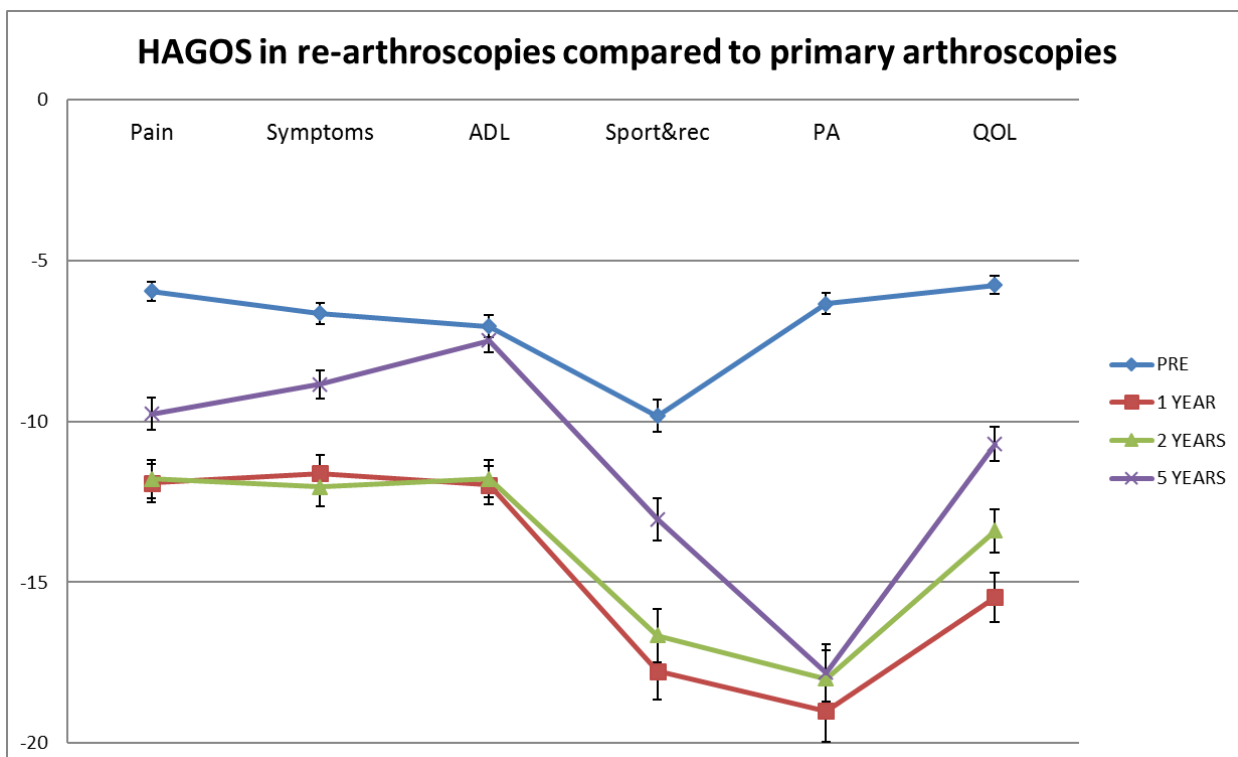
<b>PROMS 2 Years (n=329 (39%))</b>	<b>2012-2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>Mean (95% CI)</b>
HAGOS					
Pain	<b>61.4</b>	<b>54.3</b>	-	-	<b>61.0 (58.1 – 63.8)</b>
Symptoms	<b>56.5</b>	<b>52.6</b>	-	-	<b>56.2 (53.6 – 63.8)</b>
ADL	<b>63.9</b>	<b>57.3</b>	-	-	<b>63.5 (60.1 – 66.8)</b>
Sport & rec	45.3	<b>33.5</b>	-	-	<b>44.5 (41.0 – 47.9)</b>
PA	<b>31.8</b>	<b>23.9</b>	-	-	<b>31.3 (27.3 – 35.2)</b>
QOL	<b>43.7</b>	<b>34.5</b>	-	-	<b>43.1 (40.1 – 46.0)</b>
iHOT <sub>12</sub>	<b>55.9</b>	42.4	-	-	<b>54.1 (49.5 – 58.8)</b>
NRS Pain - rest	<b>27.7</b>	<b>26.3</b>	-	-	<b>27.6 (24.5 – 30.7)</b>
NRS pain – walking 15 mins.	<b>36.3</b>	<b>41.1</b>	-	-	<b>36.6 (32.8 – 40.5)</b>
VAS – Hip function overall	<b>56.4</b>	<b>50.3</b>	-	-	<b>56.0 (52.8 – 59.2)</b>
EQ5D	<b>0.70</b>	<b>0.66</b>	-	-	<b>0.70 (0.68 – 0.73)</b>
HSAS	<b>1.6</b>	<b>1.2</b>	-	-	<b>1.6 (1.4 – 1.8)</b>



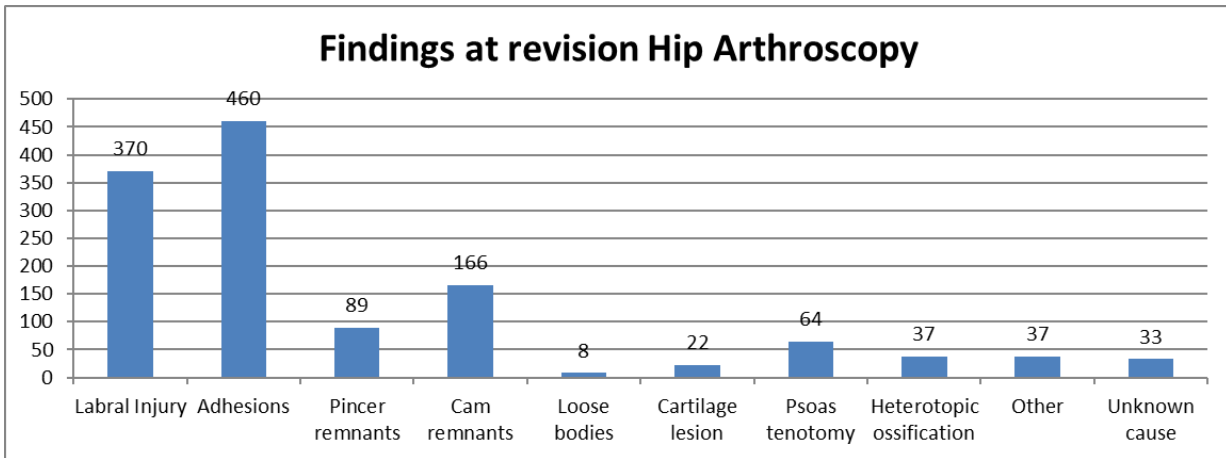
<b>PROMS 5 Years (n=147 (29%))</b>	<b>2012-2017</b>				<b>Mean (95% CI)</b>
HAGOS					
Pain	<b>64.4</b>	-	-	-	<b>64.4 (60.2 – 68.7)</b>
Symptoms	<b>59.9</b>	-	-	-	<b>59.9 (55.5 – 64.2)</b>
ADL	<b>67.8</b>	-	-	-	<b>67.8 (62.8 – 72.7)</b>
Sport & rec	<b>49.3</b>	-	-	-	<b>49.3 (44.1 – 54.5)</b>
PA	<b>36.8</b>	-	-	-	<b>36.8 (31.0 – 42.6)</b>
QOL	<b>47.8</b>	-	-	-	<b>47.8 (43.0 – 52.6)</b>
iHOT <sub>12</sub>	<b>56.9</b>	-	-	-	<b>56.9 (51.1 – 62.7)</b>
NRS Pain - rest	<b>24.9</b>	-	-	-	<b>24.9 (20.3 – 29.5)</b>
NRS pain – walking 15 mins.	<b>31.1</b>	-	-	-	<b>31.1 (25.8 – 36.5)</b>
VAS – Hip function overall	<b>58.6</b>	-	-	-	<b>58.6 (53.8 – 63.5)</b>
EQ5D	<b>0.73</b>	-	-	-	<b>0.73 (0.69 – 0.77)</b>
HSAS	<b>1.6</b>	-	-	-	<b>1.6 (1.4 – 1.96)</b>



**Fig. 24.** HAGOS results after re-arthrosopies show the same tendencies with improvements over time, but impaired results compared to primary hip arthrosopies are seen.



**Fig. 25.** Shows the difference in mean HAGOS points between primary hip arthrosopies and re-arthrosopies. Data for primary arthrosopies are used as baseline. The negative values shows that the re-arthrosopies have worse results than the primary arthrosopies – that is not improving as much. There are markedly worse HAGOS results after re-arthrosopies, especially for the physically demanding activities. 5-year results seem to improve a bit except for Physical Activity.



**Fig. 34.** Cumulated numbers of findings and procedures during re-arthroscopies. This shows the reported findings at revision hip arthroscopy as stated by the surgeons. Most found were adhesions, non-healed labral tears, residual cam, and pincer among others.

## Dansk resume

I Danmark er hofteartroskoper reguleret af Sundhedsstyrelsen via Specialeplanen for Ortopædkirurgi og er en såkaldt regionsfunktion. Dvs. kun hospitaler og klinikker med denne tildelte funktion må lave hofteartroskoper på patienter i det offentlige sundhedsvæsen. Aktuelt er der 11 hospitaler og klinikker, der har denne tilladelse.

Siden 2012 har det været muligt at indberette online til Dansk Hofte Artroskopi Register (DHAR). Aktuelt er der 16 hospitaler og privatklinikker, der indberetter. Forsikringspatienter er ikke omfattet af Specialeplanen for Ortopædkirurgi, men der indberettes også fra privatklinikker, der udfører hofteartroskoper på forsikringspatienter.

Patienterne bedes om at udfylde Patient Relaterede Outcome Measures online før operationen og igen efter 1, 2, 5 og 10 år. (VAS-hoftefunktion, NRS-rest (smerte), NRS-walk (smerte), HAGOS, iHOT<sub>12</sub>, EQ5D og HSAS score). Pga. en tidligere manglende dansk version er iHOT-12 først blevet tilgængelig fra 2019.

Ved årsskiftet 2022-2023 var der registreret i alt **8.544** hofteartroskoper i DHAR. Der er ved årsskiftet registreret **4.899** præoperative inklusion PROMs i registeret. Der er **4.056** PROMs registreret efter 1 år og der er i alt registreret **2.942** 2 års PROMs i DHAR. Desuden er der ved årsskiftet registreret **1.420** PROMs med et follow-up på 5 år.

DHAR Styregruppe, Torsten Grønbech Nielsen (databehandler) og Erik Poulsen (LPR-udtræk).

Bent Lund, Formand, overlæge  
Ortopædkirurgisk Afd. Hospitalsenheden i Horsens  
[bentlund@rm.dk](mailto:bentlund@rm.dk)

## English summary

In Denmark, hip arthroscopies are regulated by the Danish Health Authorities and only 11 public hospitals have the permission to perform the operation on patients from the Public Healthcare System. In 2012 the Danish Hip Arthroscopy Registry (DHAR) was initiated, and the surgeons started to complete the forms on-line. In total 16 hospitals and clinics are reporting to the DHAR. Most private clinics report to DHAR even though they are not entitled to.

The patients were asked to complete various Patient Related Outcome Measures pre-operatively (HAGOS, iHOT<sub>12</sub>, VAS-hip function, NRS-rest (pain), NRS-walk (pain), EQ5D and the HSAS score). Both the surgeon related, and patient related registrations are web based. Due to lack of a Danish version, iHOT<sub>12</sub> was only included from 2019.

At the end of 2022 there are included **8.544** hip arthroscopies in the DHAR. There are **4.899** pre-op inclusion PROMs included in this report. There are **4.056** PROMs included at 1-year and there are **2.942** 2-year PROMs in the registry. So far, we have **1.420** PROMs with a 5-year follow-up.

Bent Lund, Chairman, Chief Surgeon  
Dept. of Orthopedic Surgery  
Horsens Regional Hospital, Denmark  
[bentlund@rm.dk](mailto:bentlund@rm.dk)

**Publications from DHAR:**

1. Mygind-Klavsen B, Nielsen TG, Maagaard N *et al.* Danish Hip Arthroscopy Registry: an epidemiologic and perioperative description of the first 2000 procedures. *J Hip Preserv Surg* 2016 Feb 25;3(2):138-45.
2. Lund B, Mygind-Klavsen B, Nielsen TG *et al.* Danish Hip Arthroscopy Registry (DHAR): the outcome of patients with femoroacetabular impingement (FAI). *J Hip Preserv Surg*. 2017 Apr 4;4(2):170-177. doi: 10.1093/jhps/hnx009.
3. Lund B, Nielsen TG, Lind M. Cartilage status in FAI patients – results from the Danish Hip Arthroscopy Registry (DHAR). *SICOT J*. 2017;3:44. doi: 10.1051/sicotj/2017023.
4. Ishøi L, Thorborg K, Kraemer O *et al.* Return to Sport and Performance After Hip Arthroscopy for Femoroacetabular Impingement in 18- to 30-Year-Old Athletes: A Cross-sectional Cohort Study of 189 Athletes. *Am J Sports Med*. 2018 Sep;46(11):2578-2587. doi: 10.1177/0363546518789070.
5. Ishøi L, Thorborg K, Kraemer O *et al.* The association between specific sports activities and sport performance following hip arthroscopy for femoroacetabular impingement syndrome: A secondary analysis of a cross-sectional cohort study including 184 athletes. *J Hip Preserv Surg*. 2019 Jun 5;6(2):124-133. doi: 10.1093/jhps/hnz017.
6. Ishøi L, Thorborg K, Kraemer O *et al.* Demographic and Radiographic Factors Associated With Intra-articular Hip Cartilage Injury: A Cross-sectional Study of 1511 Hip Arthroscopy Procedures. *Am J Sports Med*. 2019 Sep;47(11):2617-2625. doi: 10.1177/0363546519861088.
7. Mygind-Klavsen B, Lund B, Nielsen TG *et al.* Danish Hip Arthroscopy Registry: Predictors of Outcome in Patients with Femoroacetabular Impingement (FAI). *Knee Surg Sports Traumatol Arthrosc*. 2019 Oct;27(10):3110-3120. doi: 10.1007/s00167-018-4941-3
8. Poulsen E, Lund B, Roos EM. The Danish Hip Arthroscopy Registry: Registration Completeness and Patient Characteristics Between Responders and Non-Responders. *Clin Epidemiol*. 2020 Aug 4;12:825-833. doi: 10.2147/CLEP.S264683.
9. Mygind-Klavsen B, Kraemer O, Hölmich P, Lund B. An Updated Description of More Than 5,000 Procedures from the Danish Hip Arthroscopy Registry. *J Bone Joint Surg Am*. 2020 Nov 4;102(Suppl 2):43-50. doi: 10.2106/JBJS.19.01496.
10. Mygind-Klavsen B, Lund B, Nielsen TG, Maagaard N, Kraemer O, Hölmich P, Winge S, Lind M. Capsular closure in patients with femoroacetabular impingement syndrome (FAIS): results of a matched-cohort study from the Danish hip arthroscopy registry. *J Hip Preserv Surg*. 2020 Oct, p. 474-482. hnaa033, <https://doi.org/10.1093/jhps/hnaa033>
11. Mygind-Klavsen B, Nielsen TG, Lund B, Lind M. Clinical outcomes after revision hip arthroscopy in patients with femoroacetabular impingement syndrome (FAIS) are inferior compared to primary procedures. Results from the Danish Hip Arthroscopy Registry (DHAR). *Knee Surg Sports Traumatol Arthrosc*. 2021 Apr;29(4):1340-1348. doi: 10.1007/s00167-020-06135-w.





12. Ishøi L, Thorborg K, Ørum G, Kemp J, Reiman M P, Hölmich P. How Many Patients Achieve an Acceptable Symptom State After Hip Arthroscopy for Femoroacetabular Impingement Syndrome? A Cross-sectional Study Including PASS Cutoff Values for the HAGOS and iHOT-33. *Orthop J Sports Med.* 2021 Apr 9;9(4):2325967121995267. doi: 10.1177/2325967121995267.
13. Dippmann C, Siersma V, Overgaard S *et al.* Acetabular retroversion does not affect outcome in primary hip arthroscopy for femoroacetabular impingement. *Knee Surgery, Sport Traumatol Arthrosc* 2022;**30**:3535–43.
14. Martin RK, Wastvedt S, Lange J *et al.* Limited clinical utility of a machine learning revision prediction model based on a national hip arthroscopy registry. *Knee Surgery, Sport Traumatol Arthrosc* 2022, DOI: 10.1007/s00167-022-07054-8.