UK PHYSIOTHERAPY HIP NETWORK

CONSERVATIVE TREATMENT FOR FEMORO-ACETABULAR IMPINGEMENT SYNDROME

Topic covered by this guidance

This guidance covers conservative physiotherapy management of adults (over age 16) with Femoro- Acetabular Impingement (FAI) syndrome.

The target audience is physiotherapists working within the UK NHS.

Goals

To support NHS physiotherapists in providing:

- Appropriate advice, assessment and treatment for patients referred to physiotherapy for conservative management of FAI syndrome.
- Timely referral to secondary care or other specialist services.
- Suggestions on a range of options for service delivery for FAI syndrome patients.

How can I manage a person with FAI syndrome?

Consider the following in the assessment of patients referred for conservative management

Review

- A full subjective assessment incuding history of presenting problem, aggravating and alleviating factors of symptoms, past medical history and medication, social history including occupation, hobbies and lifestyle, response to previous treatments, expectations and goals, fears and beliefs[1].
- A full objective examination assessing for intra-articular and extra- articular issues related to the hip, pelvis, spine and lower limb which includes joint and soft tissue range, movement control, muscle strength and dynamic control, endurance and lower limb function pertinent to the lifestyle of the patient.
- The use of formal outcome measures can provide objective information on progress.
- There is no evidence which identifies the optimum duration of physiotherapy, however most studies identify improvement with three months of treatment[2]. We therefore suggest this as a time point for reviewing goals, progressing if indicated or to identify the need for orthopaedic review and signposting to other services if no improvement is seen.

Advice and information:

- All studies which have evidence for improvement with conservative treatment include advice and education as core elements of their intervention, although there is no current evidence that it infers benefit in isolation[1,3–13]

- Offer information and education about the causes of FAI syndrome and the evidence for treatment. All research published to date shows that function and pain improve for a substantial number of patients through active rehabilitation[1,3–13]

- Although surgery shows a more significant benefit[1,7–15] physiotherapy should feature before this as sufficient improvement may be gained with conservative care to avoid surgery. This progresion of treatment is recommended in NHS young adult hip referral pathways.
- Offer joint protection advice including avoidance or adaptatation of aggravating activities, static and dynamic postures. This often includes avoiding or adapting:
    - prolonged sitting, particularly sitting cross legged which combines hip flexion, internal rotation and adduction.
    - standing 'hanging' on the hip.
    - deep hip flexion such as deep squatting into full hip flexion or a racing cycling position. Offer modifications e.g. quads dominant squat or adjusting seat and handlebar position
    - specific activities. Consider advising technique modification e.g. running with a wider foot position and gluteal activiation to reduce internal rotation of the femur.
- Analgesia. Consider use of simple analgesia or 2-4 weeks of NSAIDS if tolerated, or referral for guided intra-articular injection to assist adherence to an active rehabilitation programme[7].

Exercises

All studies comparing an exercise based physiotherapy programme with either surgery or alternative physiotherapy management show that an active, exercise based programme results in improvement in strength, function and/or pain for many patients. There are common elements in these studies[1,3–14]

- A goal based physiotherapy programme with goals agreed between the patient and physiotherapist.
- An individualised programme specifically tailored to the clinical presentation and goals of each patient.
- A progressive approach, building on gains in strength, movement control, balance and proprioception, hip range and functional activity leading to retraining specific to the need of the patient.
- An emphasis on muscle strengthening including gluteus maximus, gluteus medius, deep hip external rotators, and adductors is suggested.
- Incorporation of exercises to improve core and pelvic stability.
- Incorporation of exercises to facilitate functional movement control of the hip, lumbosacral spine, pelvis and lower limb.
- Stretching is less emphasised and when used should be within pain free joint range. Soft tissue stretches of the iliopsoas, short hip external rotators and adductors is suggested.
- The frequency and duration of treatment described varies between 6 to 10 sessions over 12 to 24 weeks, suggesting regular review over several months should be offered to patients with FAI syndrome.
- Gym based sessions to improve strength and cardiovascular conditioning are recommended in some studies[3,4,16].
- The use of written and visual exercise programmes supplemented by exercise diaries can be suggested to motivate, progress and review progress[1].

Other physiotherapy modalities

- Although there are no RCT's investigating the use of manual therapy alone as treatment for FAI syndrome, non-forceful techniques are frequently included as a treatment option in the reviewed RCT's. Techniques included hip joint mobilisations such as distractions and AP glides and trigger point work[1,3–5,14,15].
- Treatment of other contributory co-morbidities e.g. low back and knee problems should be considered [1].
- Orthotics varying from simple 'over the counter' shock absorbing insoles to custom made correction of abnormal contributory foot posture[1].
- Taping of the hip soft tissues as a form of pain relief, proprioceptive stimulus or to facilitate normal movement and lower limb posture can be considered[1].
- Gait training, hydrotherapy, video gait analysis and use of varied surfaces was used in one study as a way of progressing to sport specific movements[16].

- Referral for image guided intra-articular injection was included in one study as a way of achieving sufficient pain relief to allow participation in a physiotherapy programme[1].

Links to evidence based exercise programmes

- **FASHIoN**[1]:
  bjsports-2016-096368supp_C.pdf

- **physioFIRST**[3]**:**
  https://www.jospt.org/doi/10.2519/jospt.2018.7941?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%20%200pubmed

- **Mansell et al**[14]:
  https://static-content.springer.com/esm/art%3A10.1186%2Fs12891-016-0914-1/MediaObjects/12891_2016_914_MOESM5_ESM.pdf

  Untitled (springer.com)

- **Aoyama et al**[6]:
  https://journals.lww.com/cjsportsmed/fulltext/2019/07000/a_prospective,_randomized,_controlled_trial.3.aspx

Link to manual therapy techniques

- **Mansell et al**[14]**:**
  Appendix–OMPT Hip.pages (springer.com)

Progression

A progressive approach to treatment starting with exercise within pain free limits and low tissue load is suggested along with review and treatment of other co-morbidities. As gains are made in function, strength, movement range and control, balance and proprioception, loads can be steadily increased as tolerated and retraining specific to the needs of the patient incorporated. For patients engaged in sport, a return to sport assessment and programme should be considered[1,3,4].

Several studies progress to individual or group sessions in a gym for strength, conditioning and general fitness programmes incorporating sports or activity specific exercise[3,4,16].

Outcomes

Use of a validated measure is recommended to establish a baseline on which to base goal progression, measure final outcome, and signpost the need for orthopaedic review or referral to other services.

A variety of hip specific, musculoskeletal specific and general activity outcome measures are incorporated with objective physical measures in the literature and clinical practice. Hip specific outcome measures include the International Hip Outcome Score (iHOT 12 and iHOT 33), the Hip disability and Osteoarthritis Outcome Score (HOOS), the Copenhagen Hip and Groin Outcome Score (HAGOS) and the Non-Arthritic Hip Score (NAHS). Musculoskeletal outcome measures include the Lower Extremity Functional Scale (LEFS), Single Assessment Numeric Evaluation (SANE), the Global Rating Of Change (GROC), Musculo-Skeletal Health Questionnaire (MSK-HQ) and Patient-acceptable Symptom State (PASS). Generic measures of health included the widely used EQ-5D-5L.

A consensus paper in 2020[17] which included physiotherapists amongst the review panel, recommended HAGOS and iHOT as the most appropriate patient reported outcome measures in FAI syndrome. In addition, the iHOT 12 is used to measure surgical outcomes on the UK Non-Arthroplasty Hip Register.

Service delivery suggestions

- A systematic review on the use of conservative treatment found that programmes that used supervised treatment conferred greater benefit than unsupervised treatment, however most studies used a range of pragmatic options to engage patients in treatment[2].
- One study showed equal benefit between a supervised and a home exercise programme and most studies issue home exercises to supplement supervised treatment. However, a standalone home programme could be considered if a patient is unable to attend for any reason[5].
- Regular face to face attendance is recommended as progression through rehabilitation is based on achievement of goals including restoration of muscle strength, range of movement and control which would need to be assessed by the physiotherapist. However, as the regular attendance over several months recommended in many studies can be difficult for both departments to provide and patients to attend, telephone or video consultation could be considered for interim reviews.
- Telephone, e-mail or video appointments can be considered particularly if geographical distance prevents attendance.
- Group sessions for later rehabilitation in a gym are used in several studies to supplement treatment particularly as rehabilitation progresses to return to sport activity[3,4,16].
- Information including exercise programmes can be delivered via leaflet, on line or through social media.

Basis for recommendations

Following a literature search to identify levels 1-3 evidence, a panel of 4 clinicians reviewed 29 papers of which 8 were meta analyses or systematic reviews[,2,16,18–23].

No full RCT's on conservative treatment alone were identified. After an initial review of 9 papers[3–6,25–29], case series, protocols for unpublished RCT's and studies which were not specific to FAI syndrome alone were excluded[25–29]. The 4 remaining pilot studies on conservative treatment were reviewed in detail[3–6], along with publications from 4 RCT's[1,3,7–15] comparing surgery and physiotherapy. The aims of the review were to:

- Identify evidence for the best practice conservative care.
- Identify the effects of conservative care, including from RCTs comparing conservative care with surgery.

The findings of the four RCT's comparing arthroscopy and physiotherapy are supported by systematic reviews concluding that both interventions improve outcomes but that arthroscopy offers statistically and clinically superior hip-related outcomes in the short term compared with those treated with physical therapy alone. All these studies recruited participants from orthopaedic clinics in secondary and tertiary care. There are no studies exploring the effects of rehabilitation earlier in the patients pathway which is when conservative care is recommended in the NHS with referral for surgical opinion only considered if this fails. Research on the effects of conservative care at this point in the patient pathway is needed.

The UK and Australian FASHION RCT's[1,7–11] used largely the same protocol comparing surgery with 'Personalised Hip Therapy' (PHT). There is a clear description of the development of the conservative arm of the study which included a systematic review of the literature and due to its paucity a Delphi process followed to identify best practice. Currently, the FASHION study provides a combination of clearly described physiotherapy intervention and the largest cohort of participants in which the effects of treatment are reported.

PHT incorporated four core components: assessment; patient education, pain relief and an exercise programme taught in the clinic and repeated at home. The exercise programme was individualised for the patient from a selection of suggested (but not mandatory) exercises, progressed and supervised. Between six and ten face-to face contacts were permitted over 12–24 weeks and telephone or email contact could be substituted when necessary. 8% patients crossed over from physiotherapy to surgery after 1 year.

The UK FASHION study[1,7–9] was carried out over 23 NHS sites, recruiting 348 participants. The primary outcome (iHOT 33) improved beyond the minimal clinically important difference (MCID) of 6 points in the PHT group from a baseline

of 35.6 (SD 18.2) to 49.7 (SD 25) after 12 months. Baseline iHOT in the arthroscopy group was 39.2 (SD 20.9) improving to 58.8 (SD 27) after 12 months. There was no significant difference between surgery and PHT in SF-12 or EQ-5D-5L scores at 6 or 12 months after randomisation. Personalised hip therapy was more cost-effective than hip arthroscopy at 12 months.

The primary outcome in the Australian FASHION[10,11] was change in glycosaminoglycan (GAG) content of the hip joint cartilage measured using the dGEMRIC technique. The adjusted group difference in dGEMRIC change at 12 months was -59 ms (95%CI − 137.9 to - 19.6, p = 0.14) favouring PHT although this was not statistically different. Patient outcome results showed the same trends as the UK FASHIoN study.

Qualitative patient interviews were also carried out as part of the FASHIoN study[9]. The comments and opinions of study participants varied depending on whether they had benefited from the treatment they were allocated to. Patients whose hip improved with PHT found that they managed their pain much better with the exercises. Most had returned to an active lifestyle and hobbies albeit with modification and they felt this change improved their quality of life. Participants who had not found benefit from their allocation to PHT reported no change or worsening pain with their exercise programme and only short-lived benefit in strength and mobility. As a result, they were unable to return to their valued physical activities. This group described fewer and shorter physiotherapy sessions and were disappointed in their experience of PHT reporting that this relied on them doing the exercises alone, however all respondents found the PHT improved their core strength and all appreciated not having to take lot of time off from work and other leisure activities for treatment when compared to if recovering from surgery.

A second UK based RCT[12,13] study of 222 patients over 7 NHS sites also compared surgery with physiotherapy. The physiotherapy intervention was based on the consensus of the study team and existing literature. The intervention was goal based and participants were given advice on avoiding positions of impingement and completed a maximum of 8 physiotherapy sessions over 5 months. Exercise was focussed on strengthening, core stability and movement control. Physiotherapists received information on the study protocol and a training session but a full description of the programme was not published.

51% of participants randomised to arthroscopic surgery and 32% randomised to a programme of physiotherapy and activity modification reported an improvement in HOS activity of daily living score (ADL) between baseline and 8 months at or beyond the MCID of 9 points. Mean baseline HOS ADL in the physiotherapy group was 65.9 (SD 18.7) and 69.2 (SD 19.1) after 8 months. Forty eight percent of participants in the arthroscopic surgery group and 19% in the physiotherapy programme group achieved the patient acceptable symptomatic state (PASS) after treatment. 2 patients crossed over from physiotherapy to surgery after 8 months.

A fourth RCT[14,15] was carried out at a single USA military hospital. One inclusion criterion was that six weeks of conservative management needed to have failed for the patient to be included in the study. Prior to randomisation to either arthroscopy or physical therapy, all patients attended a self-management class where information, advice on self-management and exercises were issued. After six weeks dissatisfied patients could enrol in the study. Perhaps unsurprisingly, there was a high cross over to surgery from the physiotherapy group with 70% of participants ultimately having surgery. The physical therapy group attended a twice weekly personalised 45 minute supervised programme in clinic over 6 weeks focussing on motor control exercises, mobility exercises and manual therapy. In the 11 participants who did not have surgery, iHOT 33 scores improved from 32.2 (23.5 to 41.0) at baseline to 42.0 (24.7 to 59.2) after 2 years. A clear exercise programme was published containing helpful information on the advanced level rehabilitation completed by this high functioning cohort of patients.

There is one meta- analysis explicitly examining the research on physiotherapy as a treatment for FAI syndrome[2] and a further two which look more widely at conservative management including intra articular injection for FAI syndrome and more general hip pain[16,18]. All the original studies reviewed in these meta-analyses, are pilot/ feasibility or cohort studies of small numbers of participants using short term follow up of up to three months. Although the original studies and therefore systematic reviews are heterogenous, they tend to emphasise the importance of an active approach including strengthening, education and activity moderation carried out for at least 3 months. These systematic reviews revealed statistically significant improvements in pain and function with physiotherapy.

The systematic review by Hoit et al[2] looked at 5 studies. Pooled analysis demonstrated improved outcomes in the treatment groups compared with the controls (standardized mean difference 0.76; 95% CI, 0.38-1.13; P 0.0001). Core strengthening, active and supervised physiotherapy were found to result in statistically significant improvements in functional outcomes compared with no core strengthening, passive modalities, and unsupervised care.

The original research comparing different approaches to conservative care in FAI syndrome specifically is contained within 4 small pilot studies:

The Physiotherapy for Femoroacetabular Impingement Rehabilitation STudy (physioFIRST)[3] recruited 24 participants who were randomised to specific or more general exercise. Participants in the intervention group had treatment targeted to their physical impairments which included manual therapy to the hip and specific strengthening for the hip adductors, abductors, extensors, external rotators and trunk plus functional activity. The control group received manual therapy, stretching, and health education. In addition, all participants had 8 sessions of physiotherapy over a 12 week period and 12 weekly supervised gym visits plus 2 additional unsupervised sessions per week.

The intervention group had gains of moderate to large positive effect size in hip pain, function, quality of life, trunk endurance and strength in all hip muscle groups. The control group also had moderate to large increases in hip abductor and extensor strength, but not in adductor, external rotator strength or trunk endurance. Across all studies of conservative treatment, this pilot study shows the largest change in pre to post intervention iHOT scores. In the intervention group the mean change in iHOT pre and post treatment was 27 (SD 26); effect size 1.34 (95% CI 1.15, 1.53), compared to 11 (SD 8); effect size 0.42 (95% CI 0.00, 0.83) in the control group. The intensive exercise programme is clearly described and illustrated.

In another pilot study, Aoyama et al[6] compared an 8 week, daily exercise programme of trunk stabilization exercise with standard hip muscle exercise in 20 female patients. Both groups completed hip abduction, bridging and pelvic tilt exercises. The intervention group also performed plank and quadruped with contralateral arm and leg raises. Significant improvements in hip flexion range, abductor strength, Vail hip score and a change of 29.5 points in iHOT 12 was noted in the intervention group but not in other range of movement or strength.

A pilot study by Smeatham et al[4] compared three months intervention of manual therapy and supervised exercise with routine care (analgesia and previously issued advice) in 30 participants. Intervention consisted of up to 10 sessions of physiotherapy tailored to the patient which incorporated pelvic and femoral control plus advice on posture, activity pacing and pain relief but the programme was not standardised and a clear description was not provided. One to one treatment was delivered initially but referral to a gym based group session was permitted to progress rehabilitation. NAHS improved by 12.7 points (95% CI 4.7 to 20.7) in the intervention group and 1.8 (95% CI -5.3 to 9.0) in the control group. The improvement with intervention was beyond MCID.

In the fourth pilot study by Wright et al[5] 18 patients were recruited to 6 weeks of intervention consisting of manipulative therapy techniques twice weekly and a home exercise of muscle strengthening, stretching and neuromuscular/motor control tailored to the patients' needs and goals. The control group were issued with advice and gluteal strengthening as a home exercise. After 6 weeks, there was no significant between group differences for changes in pain or physical function measured on HOS. Both groups showed statistically significant improvements in pain measured on Visual analogue scale with a conclusion that 6 weeks of physical therapy provides significant, clinically important improvements in pain irrespective of the setting.

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