Best Practice Recommendations

MANAGEMENT OF SLIPPED CAPITAL FEMORAL EPIPHYSIS (SCFE) IN CHILDREN

SETTING	South West Surgery in Children Operational Delivery Network (SW SIC ODN)
FOR STAFF	Staff involved in the pathways for children and adolescents with suspected slipped capital femoral epiphysis (SCFE)
PATIENTS	Children who have a slipped capital femoral epiphysis across the SW SIC ODN region

Guidance

Summary

The GIRFT report highlighted ways to ensure significant improvements in National orthopaedic services. Most relevant to the management of SCFE include:

- Reduction in variation in practice
- Minimum critical volumes
- Necessity for networks in delivering complex orthopaedic procedures.

Data from the BOSS study shows the annual incidence in England equates to 3.65 per 100,000 at risk population. In the South West region, BOSS recorded 31 SCFE's in the 11 participating Hospitals over an 18 month period, which equates to (on average) less than two SCFE's per unit per year.

Broadly speaking, SCFE's in this study were divided into unstable (25%) and stable (75%). Of the stable SCFE's 50% were mild, 25% moderate and 25% severe.

In our region this is an estimated annual incidence of:

- 5 unstable slips
- 7 mild stable slips
- 4 moderate stable slips
- 4 severe stable slips

It is felt that an agreed regional networked pathway for these patients would offer advantages for both clinical teams and patients and potentially improve outcomes moving forward.

Assessment

- All children admitted with slipped capital femoral epiphysis should have assessment by an orthopaedic surgeon documenting onset of symptoms, stability, severity and presence or absence of a haemarthrosis.
- The contralateral limb should be examined and radiographs interrogated for possibility of contralateral pathology.
- **The most urgent aspect of assessment in a child with an unstable SCFE is imaging to confirm presence or absence of a haemarthrosis, ideally, this should be obtained before leaving the Emergency Department.**
- SCFE are managed operatively
- Patients should be made NWB (this may include strict bedrest) until the physis has been stabilised.

Management Strategy

- **Mild Slips: Southwick angle <30°**
  - If no significant loss of internal rotation, Pin-in-situ (PIS) locally

- **Moderate Slips: Southwick angle 30-50°**
  - Determine acute nature and clinical stability
  - If acute and unstable, arrange urgent USS or 3D imaging to look for haemarthrosis.
  - If haemarthrosis present consider Parsch technique (ideally <24hr from acute symptoms). In the absence of local available expertise, refer **as a matter of urgency** to Bristol Children's Hospital.
  - If no haemarthrosis present or clinically stable, discuss with Bristol Childrens Hospital regarding management (PIS locally or non-urgent transfer to Bristol for capital realignment/corrective osteotomy).

- **Severe Slips: Southwick angle >50°**
  - Determine acute nature and clinical stability
  - If acute and unstable, arrange urgent USS or 3D imaging to look for haemarthrosis.
  - If haemarthrosis present consider Parsch technique (ideally <24hr from acute symptoms). In the absence of local available expertise, refer as a **matter of urgency** to Bristol Children's Hospital.
  - If no haemarthrosis present or clinically stable, discuss with Bristol Childrens Hospital regarding management (PIS locally or non-urgent transfer to Bristol for capital realignment/corrective osteotomy).

- **Consider Prophylactic Pinning of the contralateral side:**
  - In any pathological SCFE (underlying metabolic disorder or endocrinopathy)
  - In young patients
  - If the posterior sloping angle (PSA) >13

Follow up

- Following PIS, most children will be Touch Weight Bearing (TWB) on the affected side for at least 2 weeks if stable (longer if unstable). It is usually unnecessary to limit WB status for prophylactic pinning. Further instruction regarding weight bearing and return to activity is at the discretion of the treating surgeon on an individual case basis.
- Clinical and radiological follow up will need to continue until skeletal maturity, including monitoring of the contralateral hip.
- Access to physiotherapy in the rehabilitation phase is recommended.
- Screw removal is not recommended routinely but may be performed after fusion of the proximal femoral physis following appropriate discussion of risks and benefits with the patient.
- Consider referring residual cam deformities present at skeletal maturity to a young adult hip surgeon to discuss potential need for osteochondroplasty.

Audit and service review

- As part of the SW SIC ODN, centres should participate in audits of their slipped capital epiphysis pathway for children against these recommendations to identify opportunities to improve safety, quality and performance. Key performance and outcome measures such as coding quality, time from diagnosis to USS/3D imaging, procedures performed, re-operation rate, AVN, referral and length of stay should be considered at local and network level.

REFERENCES

1. BMJ Best Practice Guidelines - Slipped capital femoral epiphysis. https://bestpractice.bmj.com/topics/en-gb/757
2. Briggs, T, *A national review of adult elective orthopaedic services in England.* Getting it right first time, 2015. **7**.
3. Ravi, B, R Jenkinson, PC Austin, et al., *Relation between surgeon volume and risk of complications after total hip arthroplasty: propensity score matched cohort study.* Bmj, 2014. **348**.
4. Perry, D, J Wright, S Cooke, et al., *A consensus exercise identifying priorities for research into clinical effectiveness among children's orthopaedic surgeons in the United Kingdom.* Bone Joint J, 2018. **100**(5): p. 680-684.
5. Vella-Baldacchino, M, DC Perry, A Roposch, et al., *Research priorities in children requiring elective surgery for conditions affecting the lower limbs: a James Lind Alliance Priority Setting Partnership.* BMJ open, 2019. **9**(12): p. e033233.
6. Naseem, H, S Chatterji, K Tsang, et al., *Treatment of stable slipped capital femoral epiphysis: systematic review and exploratory patient level analysis.* Journal of orthopaedics and traumatology, 2017. **18**(4): p. 379-394.
7. Ziebarth, K, M Milosevic, TD Lerch, et al., *High Survivorship and Little Osteoarthritis at 10-year Followup in SCFE Patients Treated With a Modified Dunn Procedure.* Clinical Orthopaedics and Related Research®, 2017. **475**(4): p. 1212-1228.
8. Slongo, T, D Kakaty, F Krause, et al., *Treatment of slipped capital femoral epiphysis with a modified Dunn procedure.* JBJS, 2010. **92**(18): p. 2898-2908.
9. Madan, S, A Cooper, A Davies, et al., *The treatment of severe slipped capital femoral epiphysis via the Ganz surgical dislocation and anatomical reduction: a prospective study.* The bone & joint journal, 2013. **95**(3): p. 424-429.
10. Huber, H, C Dora, L Ramseier, et al., *Adolescent slipped capital femoral epiphysis treated by a modified Dunn osteotomy with surgical hip dislocation.* The Journal of bone and joint surgery. British volume, 2011. **93**(6): p. 833-838.
11. Sankar, WN, KL Vanderhave, T Matheney, et al., *The modified Dunn procedure for unstable slipped capital femoral epiphysis: a multicenter perspective.* JBJS, 2013. **95**(7): p. 585-591.
12. Tannast, M, LM Jost, T Lerch, et al., *The modified Dunn procedure for slipped capital femoral epiphysis: the Bernese experience.* Journal of children's orthopaedics, 2017. **11**(2): p. 138-146.
13. Alshryda, S, K Tsang, A Chytas, et al., *Evidence based treatment for unstable slipped upper femoral epiphysis: systematic review and exploratory patient level analysis.* The Surgeon, 2018. **16**(1): p. 46-54.

ACKNOWLEDGMENTS	This document was written by Mr Guy Atherton, Mr Sean Duffy & Mr James Barnes in collaboration with members of the South West Surgery in Children Operational Delivery Network.
AUTHORISING BODY	Version 1.0 of this document was discussed for approval at the SW SIC ODN Trauma & Orthopaedic Working Group on 16/05/2022 and circulated post meeting to the group for final sign off. For further information regarding this group please contact the SW SIC ODN core team on the details below.
VERSION CONTROL	v1.1 - minor amendments were suggested by the document authors on 01/03/2023 & these were circulated to the group for comment. V2.0 – Published version accepting changes identified in v1.1.
QUERIES AND CONTACT	For any queries related to this document please contact the South West Surgery in Children Operational Delivery Network via email: ubh-tr.swsicodn@nhs.net

Appendix A – Referral Form

All SCFE referrals to be made to the on-call team via telephone:

011734 27881 / 27882 (0900h – 1700h)
Or on call registrar through Bristol Children's Hospital switchboard (24/7)

Once you have spoken to the team please email the referral form to scfe@uhbw.nhs.uk

Patient Demographics

Name……

DOB………

Address………

GP address………

NHS………

NOK………

NOK contact number…………………………………………………………………………………………………

Referrer details

Hospital………

Consultant in charge of care……………………………………………………………………………………

Team contact details…………………………………………………………………………………………………

SCFE details

Symptom onset:	**Date ……../……../……..**	**Time ……..:……..**		
Severity of slip:	**Mild (<30°)** /	**Moderate (30° to 50°)**	/	**Severe (>50°)**
Stability of slip:	**Unstable** /	**Stable**		

Please ensure all radiological images are sent to UHBW radiology PACS system when making a referral

The development of this document was supported by the South West Surgery in Children Operational Delivery Network in collaboration with colleagues from the following organisations:

NHS Gloucestershire Hospitals NHS Foundation Trust	NHS Great Western Hospitals NHS Foundation Trust	NHS Northern Devon Healthcare NHS Trust
NHS Royal Devon University Healthcare NHS Foundation Trust	NHS Royal Cornwall Hospitals NHS Trust	NHS Royal United Hospitals Bath NHS Foundation Trust
NHS Somerset NHS Foundation Trust	NHS Torbay and South Devon NHS Foundation Trust	NHS University Hospitals Plymouth NHS Trust
NHS University Hospitals Bristol and Weston NHS Foundation Trust	Yeovil Hospital Healthcare	