Children's Epilepsy Surgery Service

Great Ormond Street Hospital for Children NHS Foundation Trust

What is the aim of epilepsy surgery?

The aim of epilepsy surgery is to remove or disconnect cerebral tissue assumed to generate ictal epileptic (seizure) activity to achieve seizure freedom or significant improvement of seizures, without detriment to function. Children are carefully evaluated to determine the area of seizure onset, and whether removal/disconnection of this area would lead to significant impairments following surgery.

Procedures that may be considered include lesionectomy, lobectomy, and hemidisconnection. Corpus callosotomy, which is most effective to control 'drop attacks' (especially atonic astatic seizures), may be considered if appropriate where patients are not candidates for any of the above mentioned procedures.

Frequently abnormalities known to be associated with seizures can be identified on MR images. However, additional specialised imaging and neurophysiological investigation techniques can help to identify surgical targets in those children with focal seizures and normal MR images.

Why is it important?

Surgery may be considered as a management option in children with focal epilepsy where medication has failed. Two thirds of children will respond to anti-epileptic medication, or have a type of epilepsy that will spontaneously remit. However this leaves one third where seizures continue. The chances of seizure freedom with a further medication after two drugs have failed is <12%.

Early onset seizures particularly are associated with poor outcome with regard to seizure control and neurodevelopment. Studies have shown that following surgery at the very least neurodevelopment is maintained, where if seizures had continued it may not have progressed. Although neurodevelopmental improvement may be seen as a secondary outcome and cannot be guaranteed, children with early onset epilepsy should be referred early to optimise seizure and overall life quality outcomes.

Who may be suitable?

Epilepsy surgery may be an option in children with focal seizures that continue despite failed medical treatment. Children should be referred for assessment if they meet one or several of the following:

- All children <24months of age with suspected focal seizure onset with or without identifiable lesion on brain MRI including those with catastrophic onset epilepsy and developmental regression. (All children <24 months should have a paediatric neurologist involved in their care).
- All children of any age with seizures and unilateral lesions on MRI, i.e. cortical malformation, developmental tumour, acquired brain injury, hippocampal sclerosis.
- Certain aetiologies and constellations require special consideration including Sturge Weber syndrome, unilateral structural brain lesions (i.e. cortical dysplasia or developmental tumours) associated with developmental regression +/- continued seizures, Rasmussen syndrome, hypothalamic hamartomata
- All children of any age with medication resistant seizures suggestive of focal onset and no identifiable lesion on MRI, that have failed treatment with ≥ 2 AEDs
- Children of any age with Tuberous Sclerosis with seizures resistant to two AEDs should be evaluated to see if seizures arise from resectable tubers located in one hemisphere.
- Children who have 'drop attacks' as part of a more complex epilepsy, with or without structural brain abnormalities, may also be suitable for a corpus callosotomy.

What does it involve?

Upon referral children will undergo an initial clinical review, which includes evaluation of previously obtained EEGs and MRI scans. A plan will then be made with regard to further investigations, which will usually include an inpatient assessment for video telemetry to record seizures, neuropsychology and neuropsychiatry assessments and if necessary repeat optimised brain MR imaging. Some children will also undergo functional MRI, for language or motor lateralisation, and functional radioisotope neuroimaging (e.g. FDG-PET, ictal/interictal SPECT). Results will then be discussed in a multidisciplinary team meeting and a decision made as to whether surgery can be offered. The family will be reviewed in outpatients to discuss the outcome and, if surgery is offered, the risks and benefits fully discussed so they can make an informed decision as to whether they wish to proceed.

What are the risks?

The aim of surgery is to achieve optimal seizure control without causing additional impairments. Overall risks will depend on the assessment and type of surgery proposed. The overall risks remain low and comparable to on-going epileptic seizures over a two year period.

Referral for epilepsy surgery

Most referrals will be made with involvement of the regional paediatric neurologists who work in close partnership with our services. We also accept referrals directly from consultant paediatricians. The responsibility for the medical seizure management of patients referred for pre-surgical evaluation remains with local paediatric services (i.e. regional paediatric neurologist jointly with local consultant paediatrician).

A referral does not necessarily mean surgery will take place but will enable appropriate assessment, discussion and ultimately choice for the family with regard to whether they wish to proceed.

GOSH CESS team also works in collaboration with King's Health Partners (KHP) and Young Epilepsy (YE).

YE is based on a beautiful 60 acre rural campus in the village of Lingfield, on the Surrey, Sussex and Kent borders. YE provides medical assessment, rehabilitation, care and education for children and young people with epilepsy and other neurological conditions. At YE, the Neville Childhood Epilepsy Centre provides in-patient interdisciplinary assessments and rehabilitation packages for children and young people aged three to 19.

KHP brings together King's College London and three successful NHS Foundation Trusts (Guy's and St Thomas', King's College Hospital and South London and Maudsley). KHP also have a long-established very experienced children's epilepsy surgery service and are the South East Thames region centre for children's neuroscience.

These partnerships mean that we can draw on the expertise of professional staff from all of these organisations, to provide a high standard of service for children and young people, with the benefit of the latest medical research.

How to refer to the Children's Epilepsy Surgery Service at Great Ormond Street Hospital for Children NHS Foundation Trust

We accept referrals from consultant paediatricians and from consultant paediatric neurologists. We are unable to accept direct referrals from parents or from GPs.

To make a referral to the Children's Epilepsy Surgery Service (CESS), please write to:

Epilepsy Coordinator
Epilepsy Unit
Level 10, Main Nurses Building
Great Ormond Street Hospital
Great Ormond Street
London
WC1N 3JH

Tel: 0207 405 9200 Ext: 5594
Email: Epilepsy.Coordinator@gosh.nhs.uk- **this is NOT a Secure email address**

Guidelines for making a referral

The following minimum information is needed:

Patient details:

- Name and details of patient including NHS number (if applicable), current GP and lead consultant
- 18-week pathway information including date referral decision made
- Whether an interpreter for the child/or family is required
- Please include, if relevant, details about social services involvement and parental responsibility

Clinical information:

- Reason for referral: epilepsy surgery consideration; other such as diagnostic, prognostic, or second opinion
- Seizure history: age of onset, first seizure, subsequent seizures, current seizures, history of status epilepticus
- Current and previous treatment
- Information about developmental progress and impact of seizures on education
- Past medical history
- Family history
- Investigation history
- Clinical examination findings

Investigations:

- Relevant EEG/video-EEG telemetry reports, including the most recent
- Neuro-imaging/MRI(via IEP/on CD-ROM)

We cannot process referrals until MRI images and EEG reports have been received

Your referral will be discussed within five working days at the CESS preliminary review MDT. We will write to you to let you know your referral has been accepted and if we need any further information in advance of this.

Epilepsy Consultants at GOSH:

- Dr S Varadkar (Clinical Lead)
- Dr S Aylett
- Dr M Clarke
- Prof H Cross
- Dr K Das
- Dr C Eltze
- Dr C Hemingway
- Dr O'Callaghan
- Dr R Robinson
- Prof R Scott