British Scoliosis Society

Caring for Patients ; Supporting Surgeons

Thursday, 29 November 2018

BSS Statement – MAGEC Rods

There has been recent publicity regarding the use of new orthopaedic implants, and there were some critical comments about the MAGEC spinal rod in particular.

The concerns raised are purely related to growing rod-type implants. There are no concerns about metal-wear debris or early failure rate with traditional spinal fusion rods.

We, the British Scoliosis Society, the British Orthopaedic Association and the United Kingdom Spine Societies Board (BSS, BOA, UKSSB) are seeking to address some of the issues raised, and to explain the background and thought processes behind use of the MAGEC rod in children with scoliosis.

MAGEC rods have been available for 10 years in the United Kingdom, and have been used by spinal surgeons specialising in children's spinal deformity surgery.

MAGEC and other growing spine systems are used in children with progressive scoliosis who are too young to perform a full spinal fusion and need a "growing" system to help straighten the spine but still allowing growth.

There are of course alternatives to MAGEC:

1. Continue to observe or brace – the problem with this is that curves in young children often progress with worsening bodily deformity and potential for chest problems if the curves get large.
2. Full spinal fusion – this is not advisable in younger children who have a lot of growth remaining. This will leave them with a shorter trunk and potentially compromised lung development.
3. Traditional growing rods (TGR) – these growing rods pre-dated MAGEC rods and were previously the procedure of choice for young children with spinal deformity. They are similar to MAGEC in that they allow growth of the spine whilst helping to straighten the spine. However, in contrast to MAGEC (which is lengthened awake in the clinic), TGR requires operations to lengthen the rod every six months. TGR patients often require 10 or more operations over the course of their treatment. There is a significant complication rate with this form of surgery, as well as pain and time off school after every surgery and the concerns around multiple anaesthetics.

Spinal surgeons, specialising in paediatric spinal deformity surgery, in general have selected MAGEC rods over TGR for the following reasons:

1. Similar spinal growth with MAGEC overall compared to TGR
2. Although there are more *unplanned* operations with MAGEC rods (for failure of the driving mechanism or related rod problems), because there is no requirement for *planned regular open lengthenings*, the overall number of operations in MAGEC patients is significantly lower than those with TGR.
3. Because of the significant reduction of open surgeries in patients with MAGEC compared with TGR, the infection rate in MAGEC is roughly one quarter of the rate in the TGR group. Infection with spinal implants is a potentially devastating complication with the potential need for removal of all the rods, long hospital stays and prolonged operations.

MAGEC rods do not always perform perfectly; in some, the mechanism fails and the rods fail to lengthen as expected and this can sometimes be associated with staining of the tissues around the MAGEC rods with metal wear dust (called metallosis). There is no current known risk associated with this metal staining but of course it is necessary to monitor for any potential problems that may arise. We are very aware of this and are following up this potential problem closely.

Following the decision by the National Institute for Health and Care Excellence (NICE) to make MAGEC rods the preferred choice of growing rod treatment in progressive early onset scoliosis, the British Scoliosis Society (BSS) advised spinal surgeons to submit the details of MAGEC operations to the British Spine Registry so that we could monitor the use and outcome of the system. The BSS position is that any MAGEC rods that are removed, for whatever reason – such as breakage, failure to lengthen, or because the patient has reached the stage where definitive fusion is required – should be submitted to one of the recognised, independent engineering laboratories for rigorous analysis and investigation. Each year, we have discussed the outcomes at our National Annual General Meeting and the agreement has been to date, that whilst there are some problems with the use of MAGEC rods, as there are with any treatment options for this condition, that they remain the best available option for many children with severe, life threatening scoliosis.

The deformed spine in the growing child is an extremely difficult problem. With *any* growing spine intervention (TGR, MAGEC or others), there will be problems. Rods break, screws come loose, infections occur. The problems occur because we are trying to balance two diametrically opposed goals 1. To *control and straighten the spine* 2. To *allow the spine to grow and restrict movement as little as possible*. The expertise in children's spinal surgery, is understanding these conflicts, difficulties and critically informing patients and families about the difficult path they have ahead of them.

We (the BSS, the BOA and the UKSSB), together with your regional spinal unit are of the agreed position that whilst there are problems with the MAGEC rods, that they remain the optimal choice in many children with severe, progressive spinal deformity.

We would recommend you discuss this issue further with your own surgical unit, who should answer your questions, and together with the information above, will hopefully go some way to allaying your concerns.