EXCISION OF THE CENTRAL PHYSEAL BAR: A MODIFICATION OF LANGENSKJÖLD'S PROCEDURE

ANDREW M. JACKSON

In the growing child a central bone bridge fusing epiphysis to metaphysis will lead to progressive shortening and deformity. Provided that its size does not exceed half the cross-sectional area of the physis normal growth can be restored by resecting the bridge, and filling the defect with fat (Langenskiöld 1981; Peterson 1984). Furthermore, as growth resumes, minor deformities will correct spontaneously. Accurate mapping of the defect and operative planning are the keys to the success of this difficult surgery and biplanar tomograms or oblique CT scans are most helpful. The conventional surgical approach is through a metaphyseal window. Considerable stereotactic skill is required and there may be difficulties with irrigation, suction, illumination, magnification, and introducing dental mirrors and cutting instruments. The use of the arthroscope has recently been advocated in this context (Stricker 1992).

Operative technique. A modified approach was developed in which a predrilled wedge of metaphysis is resected. The important horizontal cut is made 5 to 10 mm from the physis and parallel to it using the image intensifier and taking care not to damage the perichondrial ring. A tail of endosteal scarring, which extends into the metaphysis in such cases, is clearly seen on the horizontal

Fig. 2a - Central bone bridge in the physis of a seven-year-old girl. Figure 2b - Two months postoperatively. Figure 2c - Fourteen months postoperatively. The bone bridge has not recurred, the physis appears to have regenerated, and the deformity has corrected spontaneously.
cut surface, and is an accurate guide to the position of
the underlying bone bridge (Fig. 1). Using this sclerotic
bone as a landmark, a 4.5 mm drill can be passed with
confidence through the substance of the bone bridge into
the epiphysis again using the image intensifier to check
the depth (Fig. 1). This hole is then expanded using a
high-speed burr until the white of the physis is seen on
all sides.

**Case report.** This method was used in a seven-year-old
girl who had suffered neonatal staphylococcal septicaemia.
An abnormality of the knee was first noticed at the
age of two years, and by seven years there was a 10°
varus/recurvatum deformity and 2.5 cm of shortening
(Fig. 2a). The predicted shortening at maturity would
have been about 10 cm.

After the bridge resection, a locally harvested free
fat graft was used to fill the defect. By screwing the bone
wedge back on top of it the fat graft was fixed and could
not be displaced by haematoma, reducing the risk of
recurrence of the bone bridge (Fig. 2b). By 15 months,
the deformity had corrected, the lower femur had grown
more than 2 cm, and there was a slight decrease in the
leg-length discrepancy (Fig. 2c).

**Discussion.** The correction of the deformity may be due,
in part, to the fact that the physis was approached from
the concavity of the deformity, and that the periosteum
was stripped on only one side of the femur.

The main advantage of this method is that it affords
good access and it is therefore less dependent on
epiphyseal mapping. The replaced wedge of bone locks
the free fat graft in place, and, since there is no residual
cortical defect, the risk of postoperative fracture, to
which some authors refer (Foster 1991) is reduced. The
screw acts as a useful marker for the measurement of
subsequent growth.

There may be a small risk of intraoperative fracture,
but this is unlikely if the limb is correctly supported
throughout the operation.

I wish to thank Mr Alan Gardner for referring this patient for
treatment.

No benefits in any form have been received or will be received
from a commercial party related directly or indirectly to the subject of
this article.

**REFERENCES**

Foster BK. The experimental basis for growth plate surgery. In:
Menelas MB, ed. *The management of limb inequality*. Edinburgh,

Langenskiöld A. Surgical treatment of partial closure of the growth


Stricker S. Arthroscopic visualization during excision of a central

**CORRECTION**

Kristensen O, Nafei A, Kjaergaard-Andersen P, Hvid I, Jensen J. Long-
term results of total condylar knee arthroplasty in rheumatoid arthritis.


On page 804, Table III was printed with the correct
numbers in the body of the table, but incorrect percent-
ages for the ranges of motion (ROM). The amended
version is printed below.

| Table III. Distribution of 64 knees according to range
| of motion (ROM), preoperatively and at follow-up. Figures
| in *italics* represent functionally acceptable range of motion |
| -- | -- | -- | -- |
| Preoperative ROM | <60° | 60° to 94° | 95° to 104° | >105° |
| -- | 2% | 4% | 33% | 22% |
| <60° | 19% | 0 | 7 | 4 |
| 60° to 94° | 42% | 0 | 12 | 11 |
| 95° to 104° | 19% | 1 | 6 | 1 |
| >105° | 20% | 0 | 3 | 5 |