

Poster presentation

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Clinical and histological outcome of fetal spinal surgery in a chronic sheep model

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Background

Fetal surgery is a treatment modality for open spina bifida. However, the value of in-utero spina bifida repair is questionable [1, 2]. Therefore we tried to improve the surgical procedure in an animal experiment and also explored the original motive of in-utero treatment, i.e. the so-called two-hit hypothesis [3].

Material and methods

Study subjects were fetal lambs with an, at 79 days gestation, surgically created opening of the spinal canal. Biomatrix covering, applied immediately after creation of the spinal defect, was taken as a tool for surgery improvement. The clinical and pathological findings at full-term age were taken as outcome measures. For comparison, two procedures were used, i.e., spinal canal opening without closure; and closure using skin.

Results

See table 1

Conclusion

Our findings indicate that intra-uterine biomatrix closure is feasible, but as for spinal cord sparing, is not superior over closure using skin. However, due to its simplicity, biomatrix closure might imply less surgery inherent complications, including immature birth and still-birth. Further studies are necessary before definite conclusions can be drawn. The same applies to the two-hit hypothesis. With respect to this issue, our findings are supportive but not decisive.

Table 1: Findings at full term age, according to type of surgical procedure

Procedure	Clinical outcome	Histologic features
Biomatrix closure (7)	No impairment (6) Died after birth (1)	Minor cord abnormalities (4) No cord anomalies (3)
Closure using skin (3)	No impairment (2) No data available (1)	Considerable cord abnormalities (1) No cord abnormalities (2)
Unclosed defect (6)	Major paraparesis (4) No impairment (1) Died after birth (1)	Major cord abnormalities (6)