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REPAIR OF IATROGENIC SPHINCTER DAMAGE AND URINARY INCONTINENCE BY AUTOLOGOUS SKELETAL MUSCLE DERIVED CELLS (MDC)

Hypothesis / aims of study

Urinary incontinence by iatrogenic damage of the external sphincter, is not curable conservatively. We showed initial results of successful repair of sphincter function by implantation of MDC. Here we present data with a minimum follow up of 12 months after implantation in a homogenous cohort of 43 patients.

Study design, materials and methods

A tissue biopsy was obtained from the left deltoid muscle. Primary cell culture, expansion and processing of cells for transplantation were performed in the local tissue engineering center according to § 20 German pharmaceutical law (AMG). We investigated MDC by immunocytochemistry for the expression of different markers involved in muscle cell development and differentiation . 49.5% (standard error of mean SEM 2.8) were positive for a-sarcomeric actin , 7.3% (SEM 1.8) for a-smooth muscle actin, and 32.7% (SEM 10.1) for desmin. Co-immunostaining demonstrated that 2.8% (SEM 0.5) of the MDC were positive for both a-sarcomeric actin and a-smooth muscle actin. The myogenic transcription factor MyoD1 was present in up to 9.1% while no CD34 positive cells were detected. Cells injected into the sphincter were 50% of myogenic origin.Transplantation was performed 61 days (range: 16-122) after biopsy.

Results

Forty three male patients (mean age:70 years, range:56-81) were enrolled in the study. The iatrogenic sphincter defect had caused refractory grade III incontinence for 48.6 months (range:12-192). Endoscopic transplantation of $5.18x10^6$ cells (range: 0.21-19.17x106) was performed. After a minimum period of one year (range:12-60 months), 4 patients were completely continent and 19 patients registered an improvement from incontinence grade III to grade I. The improvement was observed after 4.7 months (range:2-9) and remained during the follow up. In 20 patients, no improvement was observed. Minor side effects (grade 1) were observed in 5/43 patients.

Interpretation of results

Cells injected into the sphincter were 50% of myogenic origin. The remainder are of fibroblast origin. Implantation of MDC is safe and successful procedure for the treatment of refractory urinary incontinence grade III in this specific clinical setting.

Concluding message

Implantation of MDC is safe and successful procedure for the treatment of refractory urinary incontinence grade III caused by iatrogenic sphincter damage.

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What were the subjects in the study?	**HUMAN**
Was this study approved by an ethics committee?	**No**
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Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**