Schwann cell seeded guidance tubes restore erectile function after ablation of cavernous nerves in rats.

PURPOSE: Dissection of the cavernous nerves eliminates spontaneous erections. We evaluated the ability of Schwann cell seeded nerve guidance tubes to restore erections after bilateral cavernous nerve resection in rats. MATERIALS AND METHODS: Sections (5 mm) of the cavernous nerve were excised bilaterally, followed by immediate bilateral microsurgical reconstruction. In 10 animals per group (20 study nerves) reconstruction was performed by genitofemoral nerve interposition, interposition of silicone tubes or interposition of silicone tubes seeded with homologous Schwann cells. As the control 10 animals (20 study nerves) underwent sham operation (positive control) and bilateral nerve ablation (without reconstruction) was performed in a further 10 (negative control). Erectile function was evaluated 3 months postoperatively by relaparotomy, electrical nerve stimulation and intracavernous pressure recording. RESULTS: After 3 months neurostimulation resulted in an intact erectile response in 90% (18 of 20) of Schwann cell grafts, while treatment with autologous nerves (30% or 6 of 20) or tubes only (50% or 10 of 20) was less successful (p<0.01). Whereas untreated ablated rats showed no inducible erections (0% or 0 of 20), all sham operated animals had an intact erectile response (100% or 20 of 20).
Maximum intracavernous pressure upon electrostimulation was significantly elevated using Schwann cell grafts compared to results in the other treatment groups (p<0.001). Morphological evaluation revealed advanced regeneration within Schwann cell grafts. CONCLUSIONS: Schwann cell seeded guidance tubes restore erectile function after the ablation of cavernous nerves in rats and they are superior to autologous nerve grafts.