Personalized immunotherapy with encapsulated-cell technology: feasibility, safety and efficacy results from first-in-human clinical trial in advanced relapsing solid tumors.

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INTRODUCTION:
Preclinical data shows that sustained, local delivery of low dose GM-CSF, at the immunization site by irradiated, genetically engineered tumor cells leads to a specific, long lasting anti-tumor immunity in several tumor types. Providing sustained levels of adjuvant SC in a clinical setting remains challenging. Encapsulated Cell Technology enable the sustained and controlled delivery of cytokines by immunoprotected allogeneic cells. MVX-ONCO-1 is an active, personalized cancer immunotherapy combining irradiated autologous tumor cells and encapsulated, genetically engineered allogeneic cells producing GM-CSF. Here we report the final results of a phase I clinical trial of MVX-ONCO-1 in solid tumors.

MATERIAL AND METHODS:
34 pts were enrolled in a single-arm clinical trial (NCT02193503) evaluating the safety, feasibility and efficacy of MVX-ONCO-1. Treatment regimen consists of 6 doses over 8 weeks (W1,2,3,4,6,8). Each dose consists of 2 capsules containing allogeneic cells, producing GM-CSF co-implanted with irradiated autologous tumor cells in healthy skin; capsules are removed after 1 week. All pts received at least 1 dose of MVX-ONCO-1.

RESULTS:
All pts are evaluable for feasibility, safety and efficacy. Compliant preparation of both irradiated autologous tumor cells and encapsulated MVX-1 cells was achieved in 30/34 pts (88%). No pts experienced treatment related systemic events. Local hematoma at implantation site was reported in a minority of pts. Some degree of disease control was observed in 20/34, including prolonged survival in 2/2 R/M HNSCC pts; first R/M HNSCC pt achieved PR correlated with strong immunostimulatory signals (+ve IFN-γ ELISpot at W6 and W14) and second pt is currently in CR with no antitumor therapy for >3 years. Monitoring of circulating T cell reactivity and DTH positivity correlates with >6 months survival.

CONCLUSIONS :
MVX-ONCO-1 is feasible, safe and well tolerated. Preliminary efficacy data shows immune stimulation, tumor control and intriguing prolonged survival including PR and CR as BOR in 2/2 R/M HNSCC pts. Single agent efficacy phase II study is ongoing in this population. Concurrent use of anti-PD-1 and MVX-ONCO should be tested in a subsequent clinical trial.

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