EVALUATION OF THE TISSUE RESPONSE OF POLYCAPROLACTONE/GELATIN METHACRYLATE HYBRID SCAFFOLD SEEDED WITH HUMAN UMBILICAL CORD MESENCHYMAL STEM CELLS IN AN IN VIVO RAT MODEL

ISLAMOVA G[1], CETINKAYA SE[1], DERKUS B[2], CELIKKAN F[3], SATICI N[3], SEVAL M[1], GOKMEN D[4], DOKMECI F[1]

1. Ankara University Graduate School of Health Sciences, Ankara University Faculty Of Medicine, Department of Obstetrics and Gynecology, Urogynecology Doctorate Program, Ankara, Türkiye

2. Ankara University Faculty Of Science, Department Of Chemistry, Department Of Biochemistry, Ankara, Türkiye

3. Ankara University Faculty Of Medicine, Department Of Basic Medical Sciences, Department Of Histology-Embryology, Ankara, Türkiye

4. Ankara University Faculty of Medicine, Department of Biostatistics, Ankara, Türkiye

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Gunel ISLAMOVA

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The PCL/GelMA scaffolds seeded with HUC-MSCs promote less inflammatory response with fibrosis response compared to polypropylene mesh and acellular PCL/GelMA scaffolds in the rat model

ISLAMOVA G[1], CETINKAYA SE[1], DERKUS B[2], CELIKKAN F[3], SATICI N[3], SEVAL M[1], GOKMEN D[4], DOKMECI F[1]

1. Ankara University Graduate School of Health Sciences, Ankara University Faculty Of Medicine, Department of Obstetrics and Gynecology, Urogynecology Doctorate Program, Ankara, Türkiye

2. Ankara University Faculty Of Science, Department Of Chemistry, Department Of Biochemistry, Ankara, Türkiye

3. Ankara University Faculty Of Medicine, Department Of Basic Medical Sciences, Department Of Histology-Embryology, Ankara, Türkiye

4. Ankara University Faculty of Medicine, Department of Biostatistics, Ankara, Türkiye

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Introduction

Serious complications associated with polypropylene mesh have led to the search for new materials causing less inflammation and fibrosis in the surgical treatment of POP.

Methods

In this experimental in vivo study, 32 female Wistar Albino rats were divided into four groups, receiving:

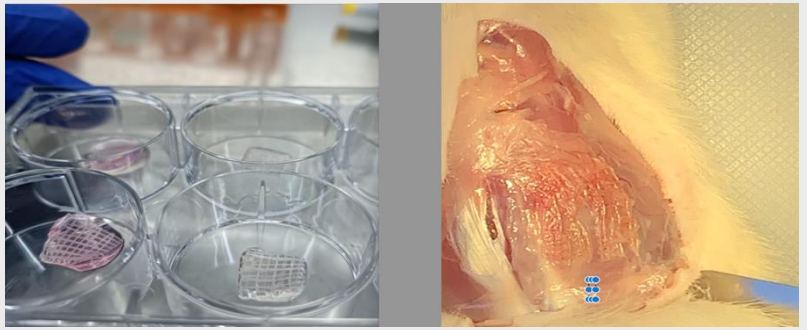
1- PCL/GelMA scaffolds with 500,000 HUC-MSCs,

2- Polypropylene mesh,

3- Acellular PCL/GelMA scaffolds,

4- Sham and control.

72 days after the implantation of all scaffolds subcutaneously, histological assessment for inflammation and fibrosis was performed with Hematoxylin/eosin and Mallory Azan staining.



Results

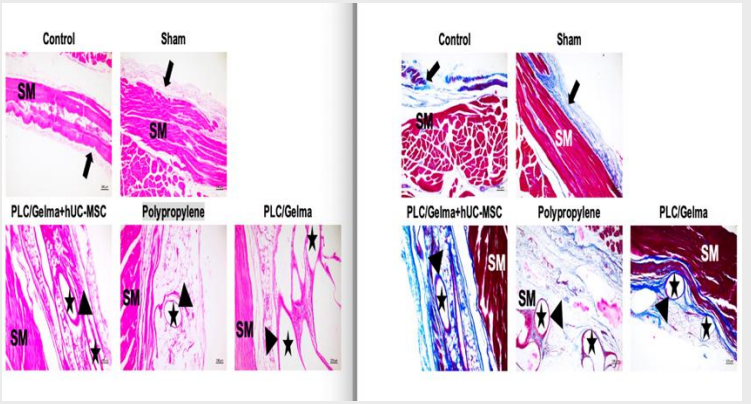
Histological analysis showed increased cell coverage and capillaries in all scaffold groups.

Inflammation was present across all experimental groups but was significantly lower in Group 4 (Sham) ($p<.001$).

Fibrosis was significantly higher in Groups 2 and 3 compared to other groups ($p<.032$).

Implications

The addition of HUC-MSCs appears to modulate inflammatory response and fibrosis levels on the PCL/GelMA hybrid scaffolds. These findings suggest a significant biomodulatory role of HUC-MSCs on the tissue response to scaffolds, warranting further investigation into their therapeutic potential.



Hematoxylin/eosin and Mallory Azan staining. Star: Scaffold cavity, arrowhead: connective tissue surrounding scaffold, arrow: connective tissue, SM: skeletal muscle.