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CASE REPORT

Amnion graft as a possible source of stem cells for endometrial regeneration after lysis of severe intrauterine adhesions

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KEYWORDS
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Abstract *Background:* The current traditional management of severe intrauterine adhesions (IUAs) is hysteroscopic adhesiolysis with application of either an intrauterine contraceptive device or a Foley catheter balloon with reported recurrence in up to 50% of cases. Recently, significant improvement with the use of amnion graft following hysteroscopic lysis of severe IUA was reported.

Case: In the present case, endometrial stromal cells (ESCs) were found within and on the surface of amniotic membrane two months after its grafting intrauterine which was confirmed with CD10 immunohistochemistry.

Conclusion: Amniotic membrane graft after hysteroscopic lysis of severe IUA, might act as a source of stem cells for endometrial regeneration; a role that will be of great value especially in severe IUAs. Further studies to confirm this finding are warranted.

1. Introduction

The use of amniotic membrane (AM) as a biological dressing has gained significance because of its ability to reduce scarring and inflammation (1), enhance wound healing and epithelialization (2) with low immunogenicity (3), as well as its antimicrobial and anti-viral properties (4).

Significant improvement was reported with the use of AM graft after hysteroscopic lysis of severe IUA, with its role suggested to be the suppression of adhesion formation and promotion of endometrial regeneration (5,6).

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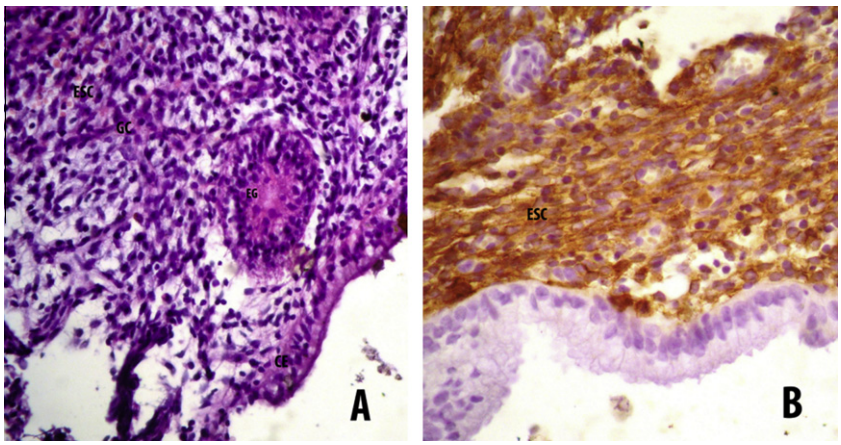

Figure 1 Histological sections of endometrial biopsy (×400). (A) Stained with hematoxylin/eosin: showing endometrial stromal cells (ESC), inactive endometrial glands (EG), foreign body giant cells (GC), and columnar epithelium (CE). (B) Immunohistochemical staining with CD10: showing strongly positive endometrial stromal cells (ESC).

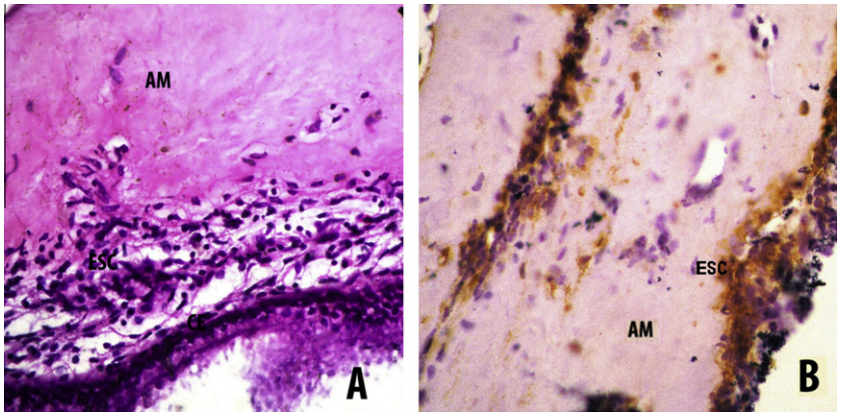

Figure 2 Histological sections of amnion graft biopsy (×400). (A) Stained with hematoxylin/eosin: showing degenerated amniotic membrane (AM), endometrial stromal cells (ESC), and columnar epithelium (CE). (B) Immunohistochemical staining with CD10: showing strongly positive endometrial stromal cells (ESC) within and on the surface of degenerated amniotic membrane (AM).

2. Case report

A woman aged 33 years had amenorrhea secondary to severe IUA with complete obliteration of uterine cavity and normal serum hormones. Hysteroscopic lysis of IUAs followed by fresh amnion graft was performed (5,6). Second look hysteroscopy, two months later, revealed adequate uterine cavity lined with thin endometrium with the amnion graft seen attached to the uterine wall. Endometrial biopsy and biopsy from the amnion graft was taken. Histological examination of the first biopsy revealed endometrial stromal cells with inactive endometrial gland and foreign body giant cells (Fig. 1(a)), whereas the second one showed degenerated amnion that contained endometrial stromal cells (ESCs) (Fig. 2(a)). Immunohistochemical examination with CD10 (7), revealed strong positive results for ESCs for both biopsies (Figs. 1(b) and 2(b)).

3. Comment

The presented case documents the development of endometrial stromal cells, as confirmed by CD10 immunostaining (7), within and overlying amniotic membrane two months after its grafting intrauterine following lysis of severe IUAs. This evidence suggests that the fresh amnion graft might act as a source of stem cells for endometrium regeneration. Human amnions have the advantages of multipotency, low immunologic antigenicity with few ethical concerns (8–11).

The amniotic basement membranes serve as a biological scaffold (12), and are biologically active regulating epithelial morphogenesis, proliferation, differentiation (13), and preventing apoptosis (14). These mechanisms are suggested to be of value after lysis of IUA to allow creeping of endometrial cells from areas without adhesions onto the amnion graft covering raw areas created after adhesiolysis. In severe IUA, however, one might assume that these mechanisms are operating along with stem cells being derived from the amnion or exposed from underneath adhesions after adhesiolysis in some cases (6). In a recent study, the therapeutic potential of Human Amnion Mesenchymal Cells (HAMCs) as a source of mesenchymal stem was proved through the introduction of enhanced green fluorescence protein (EGFP)-expressing HAMCs to mice by intrauterine infusion with documentation of the presence of

EGFP-expressing cells within the uterine mesenchyme within 1–4 weeks later (10). This concurs with the findings in the presented case, suggesting a role of HAMCs-derived mesenchymal cells in endometrial regeneration following hysterscopic lysis and application of an amnion graft.

In conclusion, amnion grafting following hysteroscopic lysis of IUA is suggested to be a promising adjunctive procedure especially if kept intrauterine and not removed during the balloon removal. In addition to its role as an anatomical barrier, it might act as a scaffold for regenerating endometrium from remnants of stem cells -helped by its growth factors. Furthermore, it possibly acts as a source of stem cells for endometrial regeneration; a role that might be of great value in severe cases of IUAs. Further studies to confirm this finding are warranted.

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