

## Gaped Wounds: An Experience with Amnion

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### Abstract

*Background:* The management of gaped wounds is a great challenge for the surgeons. Human amnion is a readily available and cost effective dressing material for these gaped wounds. *Aims:* The present study was carried out to study the efficacy of human amnion in gaped wounds following various obstetric and gynecological surgeries. *Settings and Design:* A prospective and comparative study conducted in the department of obstetrics and gynecology, Pt BDS, PGIMS, Rohtak, Haryana. *Methods and Material:* Forty patients with wound gaping were randomly allocated into 2 groups, group A (n-20) had wound dressing with human amnion after taking consent and group B (n-20) had conventional dressing with normal saline, betadene. *Statistical Analysis:* Chi square test and Fisher exact test. *Results:* Majority of patients (57.5%) had wound gaping after emergency cesarean section. Out of 20 patients in group A, epithelialization and healthy granulation tissue was observed in majority of the patients (11 patients) after 2 amnion dressings (4 days) whereas in group B, these changes were observed in majority of the patients (14 patients) after 8 days. Hence resuturing was done in majority of the patients after 4 days and 8 days in group A and B respectively (p value <0.001). Wound depth was markedly minimized in 13 out of 20 patients in group A making resuturing very easy and none in group B (p value <0.001). *Conclusion:* Human amnion is a readily available, cheap and highly effective dressing material for gaped wounds.

**Keywords:** Gaped Wounds; Amnion.

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### Introduction

The management of gaped wounds is a great challenge for the surgeons. Human amnion is a readily available and cost effective dressing material for these gaped wounds. It has unique properties of stimulating healthy granulation tissue and epithelialization. Besides, human amniotic membrane has anti-microbial and anti-inflammatory effects [1]. Hence the present study was carried out to study the efficacy of human amnion in gaped wounds following various obstetric and gynecological surgeries.

### Material and Methods

In this prospective and comparative study, 40 patients with wound gaping were randomly allocated into 2 groups, group A (n-20) had wound dressing with human amnion after taking consent and group B (n-20) had conventional dressing with normal saline, betadene. In group A, dressing was changed every 48 hours (until soaked) in comparison to group B where it was done once or twice daily.

Amnion was obtained at the time of delivery (both vaginal and cesarean) from women who were

negative for HIV, hepatitis, syphilis and had no history of premature rupture of membranes or lower genital tract infection. Meconium stained and foul smelling membranes were also discarded. Amniotic membrane was separated from chorion by gentle stripping and then washed thoroughly with normal saline. The membranes were stored in sterile bottles containing normal saline with ampicillin, gentamycin and stored in refrigerator at 4 degree centigrade (max 24 hours). Patients with severe wound sepsis, burst abdomen and cancer patients were excluded from the study.

After taking wound swab for culture sensitivity, gaped wound was cleaned with normal saline followed by application of sterile amnion and betadene in group A and B respectively. At the time of application, the amnion was thawed for 10 minutes and then put over the gaped wound with the rough surface in contact with the wound. Care was taken not to trap any air bubble beneath the membrane by applying gentle pressure. Wound was evaluated for the appearance of healthy granulation tissue, epithelialization and reduction of wound depth. Resuturing was done after wound became healthy. Patients were followed up till stitch removal (10 days) after resuturing. Statistical analysis was done by chi square test and Fisher exact test, p value less than

0.05 was considered significant.

## Results

Maximum number of patients belonged to 21-40 years age in both the groups (p value 0.834). Majority of patients (57.5%) had wound gaping after emergency cesarean section. Demographic details of patients are shown in Table 1. Wound cultures were positive in 5 patients in group A and 6 patients of group B before starting dressing (p value 0.723) as depicted in Table 2. Out of 20 patients in group A, epithelialization and healthy granulation tissue was observed in majority of the patients (11 patients) after 2 amnion dressings (4 days) whereas in group B, these changes were observed in majority of the patients (14 patients) after 8 days (Table 3). Hence resuturing was done in majority of the patients after 4 days and 8 days in group A and B respectively (p value <0.001). Wound depth was markedly minimized in 13 out of 20 patients in group A making resuturing very easy and none in group B (p value <0.001). Effect of dressing on wound depth is shown in Table 4. After resuturing, none of the patients had stitch line complications in group A but 3 patients in group B had superficial gaping.

**Table 1:** Demographic details of the patients

| Age (years)  | Group A | Group B |
|--|---------|---------|
| < 20   | 3       | 4       |
| 21-40  | 12      | 10      |
| > 40   | 5       | 6       |
| Fisher Exact test, p value 0.834, not significant. |         |         |
| Type of surgery                                    | Group A | Group B |
| Cesarean section                                   | 13      | 10      |
| Abdominal Sling                                    | 2       | 1       |
| Laparotomy   | 1       | 2       |
| hysterectomy and cystectomies                      | 4       | 7       |
| Fisher Exact test, p value 0.628, not significant. |         |         |

**Table 2:** Comparison of infection rate

| Wound culture report | Group A | Group B |
|----------------------|---------|---------|
| Infected             | 5       | 6       |
| Sterile              | 15      | 14      |

Chi square test, p value 0.723, not significant

**Table 3:** Appearance of healthy granulation tissue and epithelialisation

| No of days | Group A | Group B |
|------------|---------|---------|
| 4          | 11      | 0       |
| 6          | 8       | 1       |
| 8          | 1       | 14      |
| >10        | 0       | 5       |

Fisher Exact test, p value <0.001, highly significant

**Table 4:** Effect of dressing on wound depth

| Depth         | Group A | Group B |
|---------------|---------|---------|
| Minimized     | 13      | 0       |
| Not minimized | 7       | 20      |

## Discussion

The human amniotic membrane consists of two layers, the inner amnion and outer chorion. Embryologically, the membrane is derived from fetal ectoderm and hence can be considered analogous to fetal skin allograft [2]. However, unlike skin allograft, vascularization and rejection of amniotic membrane does not occur [3].

In 1913, Salbella presented the first clinical report of successful use of amniotic membrane in the treatment of burns and skin ulcerations [4]. In 1940, De Roth reported the use of amniotic membrane in the repair of conjunctival defects [5]. The mechanism by which amniotic membrane promotes wound healing has been postulated in various studies. One mechanism is that it accelerates the migration of fibroblasts and development of collagen during repair process [3]. It stimulates healthy granulation tissue and epithelialization and this is attributed to some angiogenic and growth factors produced by the membrane [6,7]. Kim et al suggested that the rapid healing by amnion is due to inhibition of proteinase activity thus retarding the inflammatory response by reducing infiltration of polymorphonuclear leukocytes [8]. In our study also, stimulation of epithelialization and granulation tissue was observed in majority of the patients after two amnion dressings in comparison to 8 days dressings in group B (p value <0.05). Wound depth was markedly minimized in 13 out of 20 patients in amnion group which facilitated easy resuturing without further gaping. In resource poor countries, any treatment modality which is cost effective, highly efficacious and easily available should be promoted.

Furthermore it has been reported that human amnion cells do not express on their surface HLA B, C, and DR antigens or beta-2 microglobulin which could further contribute to lower inflammatory response and relatively delayed rejection of this type of dressing [9].

## Conclusion

Human amnion is a readily available, cheap and highly effective dressing material for gaped wounds. It stimulates healthy granulation tissue and epithelialization in the wound and thereby hastens recovery process.

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