

WOUND CARE, TISSUE REPAIR & REGENERATIVE MEDICINE

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AMNIOTIC MEMBRANE TRANSPLANTATION-AN EFFECTIVE TOOL FOR WOUND HEALING IN CORNEAL ULCER

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Objectives of the study: To evaluate the efficacy and complications of amniotic membrane transplantation in wound healing of corneal ulcers.

Material and Method:

Study area: This study has been performed in tertiary care centre in north India.

Study population: The data was collected from patients attending cornea clinic of Regional Institute of Ophthalmology. Patients were admitted for amniotic membrane transplantation and discharged 1 week after surgery. Patients of all age group were considered with a range of 17-96 years.

Sample size and sample technique: A total of 30 eyes of 30 patients were randomly selected for the study from patients visiting the cornea clinic of the Regional Institute of Ophthalmology.

Data collection technique and tools: A prior informed consent was taken from all the participants. Detailed slit lamp examination about size of the ulcer, size of infiltration, depth of the ulcer, descemetocoe formation and perforation was done. Corneal scrapings were taken from the base and edge of the ulcers and were subjected to gram staining, KOH wet mount preparation and culture. Then treatment was started with broad spectrum topical antibiotics (fortified ceftazidime 50mg/ml and fortified vancomycin 50mg/ml) and topical natamycin 5 % according to the clinical appearance. Amniotic membrane transplantation (AMT) was performed 7 days after starting the treatment. In 15 cases AMT was performed with single layer inlay, in 11 cases with single layer overlay and in 2 cases with both inlay and overlay techniques. Two cases of ulcer with descemetocoe were treated with both double layer inlay and single layer overlay AMT. Thus a total of 34 AMTs were done in 30 eyes of 30 patients out of which 5 had interrupted suture and 29 had continuous sutures. After AMT all patients were followed up for 8 weeks. Parameters recorded before and after surgery were pain, redness, best corrected visual acuity, size of the ulcer, anterior chamber depth and anterior chamber reaction. Amniotic membrane status, complications and any repetition of AMT were noted.

Data analysis: The pre and post-operative values of the parameters were analyzed by using student's paired t- test.

Observation and Results:

Therapeutic efficacy

1. The most prominent feature of AMT was significant post-operative pain reduction. The mean preoperative pain was 3.70 ± 0.585 which was reduced to 2.033 ± 0.764 in the very 1st post-operative day with $P < 0.001$ and gradually decreased to 1.033 ± 0.182 at 8th week follow up with $P < 0.001$.
2. The congestion was decreased significantly from 1st week follow up with $P < 0.001$ and the anterior chamber reaction was also decreased significantly from the 1st post-operative day with $P = 0.003$.
3. Anterior chamber depth was not changed significantly ($P = 0.080$) after AMT.
4. There was significant decrease in visual acuity till 1st week follow up ($P = 0.028$). From 4th week follow up vision started increasing significantly to an average of more than counting finger close to face to 3/60 in 8 weeks ($P = 0.001$ at 4th week and < 0.001 at 8th week).
5. The mean preoperative ulcer size was $32.610 \pm 11.37 \text{ mm}^2$ which gradually decreased to $28.394 \pm 13.018 \text{ mm}^2$, $14.770 \pm 15.249 \text{ mm}^2$, $1.283 \pm 3.352 \text{ mm}^2$ and $0.033 \pm 0.182 \text{ mm}^2$ in 1st, 2nd, 4th and 8th week respectively with a P value < 0.001 at 1st week onwards. This shows very significant reduction in ulcer size after AMT. All the corneal ulcers were completely healed at the end of 8th week follow up except one.

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6. In literature, approximately 25-35% of cases of fungal keratitis require surgical interventions (lamellar or penetrating keratoplasty) at the acute stage to prevent perforation or spreading of infection. But in our study no case of treatment failure had come across requiring therapeutic or tectonic keratoplasty.

Complications: The most common complication observed was dislodgement of the membrane requiring repetition of AMT. 31% showed cheese wiring, 62% were dislodged and 3 cases required repeat AMT. 22.25% patients suffered from residual sub epithelial membrane in the visual axis reducing the final visual acuity.

Conclusions: Amniotic membrane transplantation can be used as an adjuvant treatment in bacterial and fungal corneal ulcers for early healing, less vascularization and scarring and better final visual outcome