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RESEARCH

The use of Fresh Amnion Membranes on Scar Incision of Caesarean Section

Syahredi Syaiful Adnani¹, Hafni Bachtiar²

Affiliations : 1. Sub Division of Social Obstetrics and Gynecology, Obstetrics and Gynecology Department, Faculty of Medicine, Andalas University, Dr. M. Djamil Central General Hospital Padang; 2. Public Health Department, Faculty of Medicine, Andalas University Padang

Correspondence: Syahredi Syaiful Adnani, email: syahredi_sa@yahoo.co.id, Hp: 08126632862

Abstract

In the last few decades, the incidence of caesarean section is increasing in the world, especially in Indonesia. One of the way to treat tissue scar is through biologic and synthetic dressing where nowadays, amnion has been used as biologic dressing frequently. This study was conducted to determine the effect of the use of fresh amniotic membrane on wound incision Caesarean section compared with Caesarean section incision wound covered using regular gauze bandages and fixated with plaster in RS. Dr. Reksodiwiryono Padang. The design of this study is an experimental study with Post test design with control group design. Sampling was done using a formula consecutive sampling two different test samples obtained an average of 72 people for each group. The analysis used include univariate and bivariate analyzes. The average wound healing time the difference was statistically significant (p value <0.05) in the treatment and control groups. There was highly significant difference in the proportion of local infection on day 3 between the treatment and control groups (p value <0.05). There were very significant differences in the proportion of local allergic reactions at day 3, and 5 between the treatment and control group ($p <0.05$). There are significant differences in terms of the cost of care per day between treatment and control groups ($p <0.05$). From this study, the average wound healing time has a very significant difference.

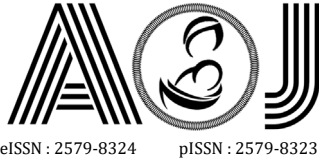
Keywords: Fresh Amniotic Membrane, Wound Caesarean Section, Wound Healing

INTRODUCTION

In recent years the incidence of cesarean section has increased in the world, including Indonesia. This claim is due to an improvement in the quality of management of cesarean section, thereby reducing the risk of complications that threaten the lives of the mother and her baby, which can reduce maternal and perinatal morbidity and mortality.¹

The incidence of cesarean section in the United States in 1965 was around 4.5%, an increase in 2010 where the incidence of cesarean section was 32.8% which means that 1 in 3 mothers now deliver a cesarean section.¹

Based on the medical records of RSUP Dr. M. Djamil Hospital Padang, the number of Caesarean section in 2010 recorded 473 cases, in 2011 there were 527 cases and in 2012 there were 661 cases. This shows that the trend of cesarean section is increasing in Dr. M. Djamil Hospital.



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Surgical delivery has risks and complications, such as bleeding and infection. Good wound management will result in a wound healing process without complications.²

To treat wounds can be biological or synthetic dressings. Amnion is often used as a biological dressing.³ Ted Eastlund said that fresh amniotic membranes contain up to 20% of stem cells, while researchers from the University of Pittsburgh found in 2005 that stem cells can be obtained from the placenta and are called human amniotic epithelial cells (HAEC). Stem cells and multipotent cells such as stem cells from amnion have the advantage of differentiating into various cell types that are important for the process of wound healing and tissue repair.

So far no research has been conducted on the use of fresh amniotic membranes in cesarean section incisions in RSUP Dr. M. Djamil Padang, and based on the foregoing the authors are interested in conducting research on the use of fresh amniotic membranes in surgical incision cesarean section performed

Patients with planned termination of a cesarean section at the hospital. Dr. Reksodiwiryono Padang. In the treatment group, fresh amniotic membranes were used in the cesarean section surgical incision and in the control group in the cesarean section surgical incision using gauze covered with ordinary bandages and fixed with tape.

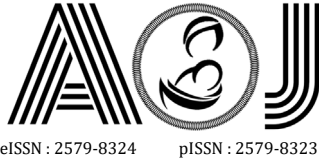
METHOD

This study is an experimental study with a Post test with control group design. The form of treatment is the use of amniotic membranes, while the effect is healing. The study was conducted in the operating room, ward, and polyclinic, obstetric gynecology Department, Dr. Reksodiwiryono hospital Padang. The study was conducted from March 2013 to June 2013. The population in this study were all patients who would have their pregnancy terminated in cesarean section at the hospital. Dr. Reksodiwiryono Padang. The total population was 154 patients.

Samples were patients who had a cesarean section incision with the sampling technique used was consecutive sampling with a total of 72 people for each group.

In the treatment and control groups, preoperative preparations were performed and all patients in the treatment group who met the inclusion criteria were attached to a fresh amniotic membrane over the cesarean incision with a distance of 1 cm from the top, bottom, left and right side of the wound. The fresh amniotic membrane was previously separated from the chorion and then washed with 0.9% NaCl liquid. In all control group patients a sterile gauze was attached to a cesarean section incision wound which was then covered with a bandage and fixed with tape.

All patients in the treatment group who met the inclusion criteria were given fresh amniotic membranes in the cesarean section incision, observations were made using a questionnaire and an assessment for wound healing during the \pm 3 day stay. Bivariate analysis



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is performed if the data are normally distributed with an unpaired t test and if the data are not normally distributed the Mann-Whitney test is used.

RESULT**Characteristic of sample****Table 1.** Characteristic subject with age, Hb, Glukosa Darah Sewaktu, Albumin, between case dan control group

Variable	Case	Control	p-value
Age (year)	29,21 ± 5,77	29,57 ± 6,13	0,716
Hb (gr/dl)	11,61 ± 1,16	11,49 ± 1,06	0,540
Blood glucose (mg/dl)	98,90 ± 15,83	99,90 ± 16,51	0,711
Albumin (gr/dl)	4,46 ± 0,86	4,40 ± 0,69	0,665

Table 2. Characteristic subject with previous caesarean section or none between case dan control group

Group	CS		Total n (%)	p-value
	None (sample) n (%)	Previous CS (sample) n (%)		
Case	37 (51,4)	35 (48,6)	72 (100)	0,617
Control	34 (47,2)	38 (52,8)	72 (100)	
Total	71 (49,3)	73 (50,7)	144	

Table 1 and Table 2 show that there were no differences in average age, hemoglobin, blood glucose, albumin and had previous cesarean section or not in the control and treatment groups with p values > 0.05. This shows that the research can be continued because the case and control groups have the same characteristics distribution.

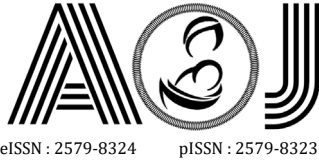
Comparison of the average healing time of a cesarean section surgical incision using a fresh amniotic membrane and ordinary bandage gauze and fixation with tape.**Table 3.** Comparison of the average healing time of a cesarean section surgical incision using a fresh amniotic membrane and ordinary bandage gauze and fixation with tape.

Variable	Case	Control	p-value
Healing time (days) (mean ± SD)	2,92 ± 1,02	5,51 ± 3,81	0,000

Table 3 shows the average wound healing time there was a very statistically significant difference (p value <0.05) in the control and case groups.

Comparison of the occurrence of local infections in cesarean section surgical incisions using fresh amniotic membranes

On days 1 and 2 everything was good (100%), no infection occurred in both case and control groups.



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Website:<http://jurnalobgin.fk.unand.ac.id/index.php/JOE>**Table 4.** Comparison of the incidence of local infection in SC surgery wounds using fresh amniotic membrane with using ordinary bandage gauze and fixation with tape on day 3

Group	Local infection			Total n (%)	p-value
	Good n (%)	Moderate n (%)	Not good n (%)		
Case	70 (97,2)	2 (2,8)	0 (0)	72 (100)	0,000
Control	33 (45,8)	37 (51,4)	2 (2,8)	72 (100)	
Total	103 (71,5)	39 (27,1)	2 (1,4)	144 (100)	

In table 4 the data obtained on day 3 in the treatment group did not occur with infection of 97.2%, whereas in the control group there is a moderate category of local infection of 51.4% and an unwell local infection of 2.8%. From the statistical test there was a significant difference in the incidence of local infection on day 3 between incision wounds using fresh amnion and incision wounds using ordinary bandage gauze ($p < 0.01$).

Table 5. Comparison of the incidence of local infection in SC surgery wounds using fresh amniotic membrane with those using ordinary bandage gauze and fixation with plaster day 5

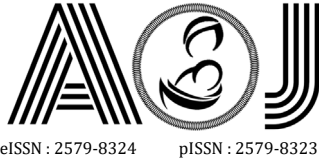
Group	Local infection			Total n (%)	p-value
	Good n (%)	Moderate n (%)	Not good n (%)		
Case	71 (98,6)	1 (1,4)	0 (0)	72 (100)	0,146
Control	66 (91,7)	5 (6,9)	1 (1,4)	72 (100)	
Total	137 (95,1)	6 (4,2)	1 (0,7)	144 (100)	

Table 5 shows that there was no local infection on day 5 in the case group at 98.6% and there was no infection (0%), whereas in the control group there was no local infection at 91.7% and local infection occurred in the bad category (1.4%). There was no significant difference in the incidence of local infection on day 5 between incision wounds using fresh amnion and incision wounds using ordinary bandage gauze ($p > 0.05$).

Table 6. Comparison of local infection events in CS surgery wounds that use fresh amnion membrane with those using bandage gauze and fixated with plain plaster on the day 14th

Group	Local infection		Total n (%)	p-value
	Good n (%)	Moderate n (%)		
Case	72 (100)	0 (0)	72 (100)	0,122
Control	69 (95,8)	3 (4,2)	72 (100)	
Total	141 (97,9)	3 (2,1)	144 (100)	

Table 6 shows that there was no local infection on day 14 in the treatment group respondents by 100% good, whereas in the control group there were no local infections by 95.8% and there was still a moderate category of local infection (4.2%). From the statistical test there was no significant difference in the incidence of local infection on day 14 between incision wounds using fresh amnion and incision wounds using ordinary bandage gauze ($p > 0.05$).



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Table 7. Distribution Subjects Based on Wound Healing Categories.

Group	Wound Category		Total n (%)	p-value
	Good n (%)	Not good n (%)		
Case	72 (100)	0 (0)	72 (100)	0,120
Control	68 (94)	4 (6)	72 (100)	
Total	140 (97,2)	4 (2,8)	144 (100)	

Table 7 shows that respondents in the case group were 100% good wound healing, while in the control group good wound healing was 94%. Statistical test results showed no significant difference between wound healing in the case and control groups ($p > 0.05$)

Comparison of local allergic reactions in the form of red spots around the wound or no allergic reaction in the cesarean section surgical incision with a fresh amniotic membrane with cesarean section surgical incision using gauze that is covered with ordinary bandages and fixed with plaster at the hospital. Dr. Reksodiwiryo Padang.

There were no (100%) local allergic reactions on days 1 and 2 in the two groups of treatment and control respondents.

Table 8. Comparison of local allergic reactions in SC surgery wounds using fresh amniotic membrane with those using ordinary bandage gauze and fixation with plaster on day 3

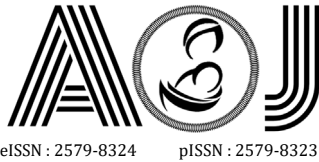
Group	Allergic Reaction		Total n (%)	p-value
	Good n (%)	Moderate n (%)		
Case	72 (100)	0 (0)	72 (100)	0,023
Control	67 (93,1)	5 (3,5)	72 (100)	
Total	139 (96,5)	5 (3,5)	144 (100)	

Table 8 shows the data in the case group on the third day 100% there was no local allergic reaction, whereas in the control group there was no local allergic reaction (93.1%) and there was a moderate category of local allergic reaction of 6.9%. From the statistical tests there were significant differences in local allergic reactions between the case and control groups ($p < 0.05$)

Table 9. Comparison of local allergic reactions in SC surgery wounds using fresh amniotic membrane with ordinary bandage gauze and fixation with tape day 5

Group	Allergic Reaction		Total n (%)	p-value
	Good n (%)	Moderate n (%)		
Case	72 (100)	0 (0)	72 (100)	0,003
Control	64 (93,1)	8 (11,1)	72 (100)	
Total	136 (94,4)	8 (11,1)	144 (100)	

Table 9 shows data in the case group on the 5th day that there was no local allergic reaction (100%), whereas in the control group there was no local allergic reaction (88.9%) and



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there was a moderate category of local allergic reaction of 11.1%. From the results of statistical tests, there are significant differences in local allergic reactions between incision wounds using amnion fresh with incision wounds using ordinary bandage gauze ($p < 0.05$).

Table 10. Comparison of local allergic reactions in SC surgery wounds using fresh amniotic membrane with ordinary bandage gauze and fixation with tape day 14

Group	Allergic Reaction		Total n (%)	p-value
	Good n (%)	Moderate n (%)		
Case	72 (100)	0 (0)	72 (100)	0,316
Control	71 (98,6)	1 (1,4)	72 (100)	
Total	143 (99,3)	1 (0,7)	144 (100)	

Table 10 shows the data in the case group on the 14th day there were no local allergic reactions (100% good), whereas in the control group there were no local allergic reactions (98.6% good) and there were still bad local allergic reactions of 1, 4%. From the results of statistical tests there was no significant difference in the occurrence of local allergic reactions between incision wounds using fresh amnion and incision wounds using ordinary bandage gauze on day 14 ($p > 0.05$)

Table 11. Comparison of average daily financing in the Caesarean section operating group using fresh amniotic membranes with those using ordinary bandage gauze and fixation with tape.

Variable	Case	Control	p-value
Costs per day (Rp) (mean \pm SD)	202368 \pm 2297	223778 \pm 42682	0,000

Table 11 shows the cost of treatment per day there was a very statistically significant difference (p value < 0.05) in the control group and treatment and this is related to the length of stay in table 3.

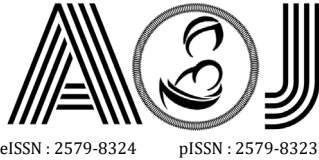
DISCUSSION

Subject Characteristic

Characteristics of the subjects in this study based on age, hemoglobin level, blood glucose examination when, albumin examination, had previous cesarean section or did not show no significant difference between the treatment group using fresh amnion and the control group using regular bandage gauze and di fixation with tape.

Comparison of the average healing time of a cesarean section wound incision using a fresh amniotic membrane with the average healing time of a cesarean section surgical incision using a gauze that is covered with a normal bandage and fixed with tape.

The results of this study found that the average wound healing time was very statistically significant ($p < 0.05$) in the case and control groups.



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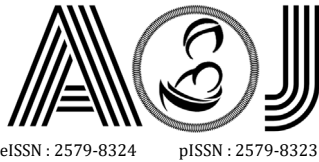
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This is in accordance with the literature, namely wound healing time by using amniotic membrane is reduced to 50% compared to conventional wound dressing.⁴ The content of fresh amniotic membrane which has a stem cell content of up to 20%, see the function of the amnion as stem cells or multipotent stem cell cells then from that amnion can be used for wound healing or tissue repair. Stem cells are able to distinguish various types of cells in the cell repair process and produce humoral substances that mediate cellular processes. Adult stem cells obtained from amnion are said to produce various kinds of cytokines and growth factors.⁵ After culture for 7 days, the amniotic membrane has a large area of cell development compared to cells from the bone marrow. TGF- β regulates cell proliferation and differentiation and plays a role in hormone secretion and wound repair. Membrancamnion can show multipotent mesenchymal stem cells better than bone marrow cells.⁶

The process of wound healing through the process of formation of blood vessels caused by angiogenic processes that occur in capillary endothelium. The presence of angiogenic and mitogenic processes in the amniotic membrane causes the wound to easily heal. Growth factors contained in the amniotic GF-beta (transforming growth factor beta); TGF-beta active (activated transforming growth factor beta); EGF (epidermal growth factor); bFGF (basic fibroblast growth factor); IL-4 (Interleukin 4); PGE2 (prostaglandin E2); IL-10 (Interleukin 10); KGF (keratinocyte growth factor); HGF (hepatocyte growth factor) is important in the process of wound healing and stimulates the angiogenic process.^{6,7}

Judging from the cost of treatment per day there was a significant difference between the case and control group ($p < 0.05$). Based on the literature on the use of bandage gauze on surgical incisions in cesarean section, secondary wound healing often occurs and leaves scar tissue on the abdominal wall. This makes the patient less happy. The use of gauze can also cause discomfort due to the thickness and weight of the gauze used. When opening the gauze also often cause fear in patients because of pain when dressing removed from the wound. There are times when dressing dressing is needed because the bandage is wet because the process of cleaning the body when bathing. It is not uncommon for postoperative cesarean section wounds to be moistened before the dressing is removed. In order to avoid the above conditions, a thinner, lighter, lighter wound cover material that can function in reducing pain, has antibacterial and angiogenetic effects, accelerates and protects the process of epithelialization and granulation and stimulation of neovascularization, adheres evenly to the wound but must be easily opened or replaced if necessary and can protect bacterial contamination from the outside well, healing wounds without scarring, increasing mobility and elasticity, translucent, semi-permeability and biodegradability.⁸

Therefore, with all the advantages of the fresh amniotic membrane content that has been described above, the duration of surgical treatment of cesarean section in hospital is shorter because the wound healing time is faster which will ultimately reduce the cost of treatment per day at the hospital.



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Comparison of local infection accompanied by pus, no pus, or no sign of local infection in a cesarean section surgical incision that uses fresh amniotic membrane with a cesarean section surgical incision that uses gauze that is covered with ordinary bandages and fixed with plaster at the hospital . Dr. Reksodiwiryo Padang.

In this study the results showed that there was no difference in the proportion of local infections on days -1,2,5 and 14 between the treatment and control groups. There was a very significant difference in the proportion of local infections on day 3 between the treatment and control groups with a p value <0.05

Amnion functions as a bacteriostatic because an amnion is found in antibodies namely allantoin which is a bactericidal product of purine metabolism that functions as an antibody generator and high concentrations of lysozyme which are bacteriolytic and bacteriostatic proteins. Progesterone is a natural bacteriostatic against gram-positive bacteria. Amnion attachment to the wound can eliminate the injured skin so the number of germs decreases. Allantoin, lysozyme, transferrin and progesterone have important roles in bacteriostatic and bacteriosid effects. Allantoin has an important role in the antibody generator while progesterone is bacteriostatic in gram-positive bacteria.^{4,9}

Comparison of local allergic reactions in the form of red spots around the wound or no allergic reaction in the cesarean section surgical incision between fresh amniotic membrane with using gauze that is covered with ordinary bandages and fixed tape at the. Dr. Reksodiwiryo hospital Padang

The results of this study indicate that there is a very significant difference in the proportion of local allergic reactions on day 3 between the case and control groups (p <0.05).

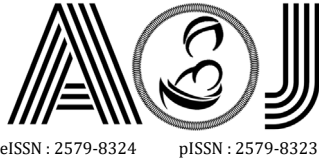
There was a very significant difference in the proportion of local allergic reactions on day 5 between the case and control groups with a p value <0.05.

There was no difference in the proportion of local allergic reactions on days 1,2 and 14 between the case and control groups with p> 0.05.

Amniotic membrane is non-antigenic or slightly antigenic. From an immunologic point of view, the amnion is a suitable transplanted material because there is no HLA-A, HLA-B, or HLA-DR antigen in the amniotic membrane, therefore rejection of the amniotic membrane does not occur. In cesarean section wounds that use regular bandages, a local allergic reaction occurs due to the plaster that functions to put a bandage on the wound.^{4,9}

CONCLUSION

There was a very significant difference in average wound healing time and the proportion of local allergic reactions (statistically p value <0.05) in the case and control groups. There was a very significant difference in the proportion of local infections on day 3 between the case and control groups, with a p value <0.05. There was a very significant difference for the cost



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of treatment per day related to the length of stay statistically (p value <0.05) in the case and control groups.

REFERENCES

1. Hamilton BE, et al. Births: preliminary data for 2010. National vital stat Rep. 2011.
2. Mallef Mallefet et P, et al. Mechanism involved in wound hhealing. Biomedical Scientist.2008.
3. Ganatra MA. Amniotic membrane in Surgery Journal of Pakistan Medical Association. Vol. 53, 2003.
4. Menkher Manjas, et al. Clinical Application of Irradiated Amnion Grafts. Allograft Procurement and Processing and Transplantation. World Scientific. 2010.
5. Miki T., Storm S.C, 2008. *Amnion Derived Pluripotent/ Multipotent Stem Cells* in Stem Cell Rev. 2006; 2(2):133-42,<http://www.ncbi.nlm.nih.gov/pubmed/1723759>, 1 juni 2012
6. Cunningham FG, Leveno KJ, Bloom S. *Implantation, Embryogenesis, and Placental development* in William Obstetrics. Mc Graw Hill, edisi 23. USA. 2010; 65-68
7. Steed DL, Trumpower C, Duffy D, etc. *Amnion derived Cellular Cytokine Solution*. NCBI. 2008. <http://www.ncbi.nlm.nih.gov/pubmed/20395817>, 31 mei 2012
8. Menkher M, Jefri H, Salmah A. *Majalah kedokteran Indonesia: Penggunaan Krim amnion pada penyembuhan Luka Sayatan Tikus Winstar*. Bagian patologi anatomi Fk Universitas Andalas. Padang. 2010.
9. Toda A, et al. The Potential of Amniotic Membran/aAmnion-derived cells for regeneration of various tissue. Journal of Pharmacological sciences 105. 2008.