

## ABSTRAK

**Latar Belakang.** Hernia insisional merupakan komplikasi operasi dinding anterior abdomen. Bahan penguat (protesa) atau biasa disebut *mesh* hernia sebagai standar baku emas adalah *mesh composite* (MC). Inovasi baru yang belum diteliti sebelumnya adalah *free omental patch* (FOP) dan kombinasi *Mesh Polypropylene-free omental patch* (MPP-FOP). *Free omental patch* merupakan jaringan yang tersedia secara alami, dekat pada area perlakuan dan tidak membutuhkan perlakuan khusus.

**Tujuan.** Penelitian ini bertujuan untuk membandingkan ekspresi *miRNA-21*, *miRNA-27b*, *VEGF*, *COL3A1*, *COL1A1*, dan *COL1A2* pada penutupan defek hernia dengan FOP, kombinasi MPP-FOP, dan MC.

**Metode.** Penelitian eksperimental murni *posttest only control*. Digunakan 18 ekor *Rattus norvegicus* sebagai model hernia insisional yang pada hari ke 14 dibagi kedalam 3 kelompok perlakuan. Setelah 21 hari, dilakukan pengambilan dinding abdomen untuk melihat ekspresi *qPCR miRNA-21*, *miRNA-27b*, IHK dan *qPCR* dari *VEGF*, *COL3A1*, *COL1A1*, *COL1A2*.

**Hasil Penelitian.** Hasil *qPCR* kelompok FOP terhadap MC dan MPP-FOP terhadap MC tidak signifikan pada ekspresi *miRNA-21*, *miRNA-27b*, *VEGF*, *COL3A1*, *COL1A1*, dan *COL1A2*. Dari uji *Kruskal-Wallis* hasil signifikan pada *miRNA-21* ( $p=0,02$ ) dan tidak signifikan pada ekspresi *qPCR miRNA-27b* ( $p=0,17$ ), *VEGF* ( $p=0,346$ ), *COL3A1* ( $p=0,664$ ), *COL1A1* ( $p=0,558$ ), *COL1A2* ( $p=0,346$ ). Hasil IHK kelompok FOP dan MPP-FOP terhadap MC tidak signifikan terhadap ekspresi dari *VEGF*, *COL1A1*, dan *COL1A2*, tetapi signifikan pada ekspresi *COL3A1* pada semua kelompok perlakuan. Dari uji ANOVA hasil signifikan pada ekspresi IHK untuk variabel *COL3A1* ( $p=0,02$ ) untuk ketiga kelompok. Sedangkan tidak signifikan untuk ekspresi IHK *VEGF* ( $p=0,562$ ), *COL1A1* ( $p=0,321$ ), dan *COL1A2* ( $p=0,36$ ).

**Kesimpulan.** Tidak terdapat perbedaan bermakna antara kelompok FOP, MPP-FOP, dan MC terhadap ekspresi *miRNA-27b*, serta ekspresi *mRNA* dan protein *VEGF*, *COL1A1*, *COL1A2* akan tetapi bermakna pada protein *COL3A1*. *Mesh composite* paling rendah pada ekspresi *miRNA-21*, dan lebih tinggi pada protein *COL3A1*. FOP dan MPP-FOP memberikan hasil penutupan defek hernia insisional yang setara dengan MC.

**Kata Kunci:** hernia insisional, *free omental patch*, *mesh polypropylene-free omental patch*, *mesh composite*, *miRNA-21*, *miRNA-27b*, *VEGF*, *COL3A1*, *COL1A1*, *COL1A2*.

## ABSTRACT

**Background.** Incisional hernia is a complication of anterior abdominal wall surgery. Reinforcing material (prosthesis) or commonly called hernia mesh as the gold standard is mesh composite (MC). New innovations that have not been studied before are free omental patch (FOP) and a combination of Mesh Polypropylene-free omental patch (MPP-FOP). Free omental patch is a naturally available tissue, close to the treatment area and does not require special treatment.

**Purpose.** This study aims to compare the expression of miRNA-21, miRNA-27b, VEGF, COL3A1, COL1A1, and COL1A2 in hernia defect closure with FOP, MPP-FOP combination, and MC.

**Method.** A posttest-only control experimental design. 18 *Rattus norvegicus* were used as an incisional hernia model which on the 14th day were divided into 3 treatment groups. After 21 days, abdominal wall samples were taken to see the expression of qPCR miRNA-21, miRNA-27b, IHK and qPCR of VEGF, COL3A1, COL1A1, COL1A2.

**Result.** The qPCR results of the FOP group against MC and MPP-FOP against MC were not significant in the expression of miRNA-21, miRNA-27b, VEGF, COL3A1, COL1A1, and COL1A2. From the Kruskal-Wallis test, the results were significant for miRNA-21 ( $p=0.02$ ) and not significant for the qPCR expression of miRNA-27b ( $p=0.17$ ), VEGF ( $p=0.346$ ), COL3A1 ( $p=0.664$ ), COL1A1 ( $p=0.558$ ), COL1A2 ( $p=0.346$ ). The CPI results of the FOP and MPP-FOP groups against MC were not significant for the expression of VEGF, COL1A1, and COL1A2, but significant for the expression of COL3A1 in all treatment groups. From the ANOVA test, the results were significant for the CPI expression for the COL3A1 variable ( $p=0.02$ ) for all three groups. Meanwhile, it was not significant for the expression of IHK VEGF ( $p=0.562$ ), COL1A1 ( $p=0.321$ ), and COL1A2 ( $p=0.36$ ).

**Conclusion.** There was no significant difference between the FOP, MPP-FOP, and MC groups in miRNA-27b expression, as well as VEGF, COL1A1, COL1A2 gene and protein expression but significant in COL3A1 protein. Mesh composite had the lowest miRNA-21 expression, and higher in COL3A1 protein. FOP and MPP-FOP provided incisional hernia defect closure results equivalent to MC.

**Keywords:** incisional hernia, free omental patch, mesh polypropylene-free omental patch, mesh composite, *miRNA-21*, *miRNA-27b*, VEGF, COL3A1, COL1A1, COL1A2.