Mesh Komposit Tiga-lapis sebagai Alternatif Penutup Defek Diafragma pada Sprague Dawley = Triple layer composite mesh as an alternative for diaphragmatic defect repair in Sprague Dawley

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Abstrak

Pendahuluan: Saat penutupan primer tidak dapat dilakukan, defek diafragma hernia diafragma kongenital (HDK) memerlukan penutup prosthesis. Mesh organik-absorbable memungkinkan tumbuhnya jaringan host seiring proses degradasi mesh. Bahan sintetik non-absorbable tidak terdegradasi namun cenderung menyusut sehingga seiring perkembangan anak dapat terjadi rekurensi dan deformitas muskuloskeletal. Peneliti menyusun mesh komposit tiga lapis dari polypropylene-human amniotic membrane (HAM)-oxygenated regenerated cellulose (ORC) sebagai anti-adhesi. Efektifitas mesh ini sebagai alternatif penutup defek diafragma dan bagaimana reaksi histologis host terhadap mesh ini akan dinilai.
Metode: dibuat defek hemi-diafragma kiri pada 20 tikus Sprague Dawley (SD) yang dibagi menjadi tiga kelompok perlakuan (KP). Defek diafragma KP-1 ditutup dengan polypropylene mesh, KP-2 dengan tiga lapis HAM, dan KP-3 dengan polypropylene-HAM-ORC. Pada hari ke-7 dan 30, dinilai ada-tidaknya rekurensi, asimetri hemithorax, dilanjutkan pemeriksaan histologis derajat jumlah polymorphonuclear cells (PMN), fibroblas, foreign body giant cells (FBGC), angiogenesis, muskularisasi, dan adhesi. Hasil: Tidak terjadi rekurensi defek diafragma dan asimetri hemithorax pada ketiga KP. Gambaran histologis ketiga KP tidak berbeda bermakna kecuali dalam hal angiogenesis pada kelompok yang menggunakan HAM. Kelompok yang menggunakan bahan anti-adhesi (KP-3) mengalami derajat adhesi teringan. Kesimpulan: mesh komposit tiga lapis dapat digunakan sebagai alternatif penutup defek diafragma SD. Mesh ini tidak menimbulkan reaksi inflamasi dan reaksi benda asing secara berlebihan.
.....Introduction: When primary closure is not possible, autologous flap or mesh repair is indicated for congenital diaphragmatic hernia (CDH) repair. Absorbable-organic meshes allow ingrowth of host tissue as they are degraded, creating natural and durable neodiaphragm. Non-absorbable synthetic patches act as strengthening replacement for diaphragm but have propensity to shrink and there is concern as the infant grows, musculoskeletal deformity and recurrence may occur. We investigated a composite mesh consist of polypropylene-human amniotic membrane (HAM)-oxygenated regenerated cellulose (ORC) as adhesion barrier. The aim of the study was to evaluate the effectiviness and host reaction to the implantated mesh.
Methods: a defect on left hemi-diaphragm of 20 Sprague Dawley were made. The first group received polypropylene mesh, second group triple layer of HAM, and the third group received HAM-polypropylene-ORC. After 7 and 30 days, reccurence, hemithorax asymmetry, and histological features of neodiaphragm were evaluated.
Results: There were no patch disruption and asymmetries of hemithorax occurred in all groups. There were no significant differences in polymorphonuclear cells (PMN), foreign body giant cell (FBGC), fibroblast, and muscularization degree. However angiogenesis were better in groups who used HAM material. Adhesions in mildest degree were found at group who used ORC.
Conclusion: Triple layer composite mesh can be used as an alternative for diaphragmatic defect repair. There was no exaggerated inflammation or foreign body reaction