Efektivitas kombinasi platelet-rich plasma dan human amniotic membran terhadap adhesi paratenon dan kekuatan tendon pada penanganan total ruptur tendon achilles akut pada kelinci putih New Zealand = The Effectiveness of platelet-rich plasma combined with human amniotic membrane on paratenon adhesion and tensile strength in the treatment of acute achilles tendon rupture in New Zealand white rabbit

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Abstrak

Pendahuluan: Kejadian ruptur tendon Achilles meningkat dalam beberapa dekade terakhir dengan insiden tertinggi didapatkan pada kelompok usia 30-39 tahun. Penanganan terkini untuk ruptur tendon Achilles adalah pembedahan dengan penjahitan primer, serta dapat juga secara konservatif pada kondisi-kondisi tertentu. Karena komplikasi adhesi dan gliding tendon sering terjadi pasca tindakan pembedahan, para peneliti berusaha menemukan bahan yang secara efektif mampu memperbaiki proses penyembuhan tendon. Platelet-rich plasma (PRP) dan membran amnion merupakan bahan yang dinyatakan memiliki potensi dalam memperbaiki proses penyembuhan tendon, mencegah adhesi dan gliding tendon. Namun, penelitian mengenai efek kombinasi keduanya masih belum pernah dilakukan.
Metode: Model ruptur tendon Achilles dilakukan pada 24 ekor kelinci putih New Zealand yang terbagi dalam 4 kelompok perlakuan, yaitu kelompok kontrol, kelompok dengan pemberian membran amnion, kelompok dengan pemberian PRP dan kelompok dengan pemberian kombinasi membran amnion dan PRP. Evaluasi dilakukan pada 6 minggu setelah tindakan pembedahan berdasarkan penilaian terhadap pemeriksaan gliding tendon dengan USG, Tang score gambaran makroskopis adhesi tendon, grading adhesi secara makroskopis, Tang score gambaran histopatologis adhesi, grading adhesi secara histopatologis, serta Tensile strength tendon dengan uji tarik. Data yang didapatkan diuji secara statistik dengan jenis data dan jumlah kelompoknya.
Hasil: Kelompok perlakuan membran amnion serta kelompok kombinasi membran amnion dan PRP memiliki perbedaan bermakna terhadap dalam hal gliding tendon secara USG, Tang score makroskopis dan histopatologis serta grading adhesi makroskopis dan histopatologis. Kelompok perlakuan PRP dan kombinasi membran amnion dan PRP menunjukkan perbedaan bermakna terhadap kelompok kontrol dalam hal nilai tensile strength test.
.....Background: The incidence of Achilles tendon rupture has increased in the last few decades with the highest incidence found in the 30-39 years of age group. The current treatment for Achilles tendon rupture is surgery with primary suturing, and can also be conservative under certain conditions. Because adhesion complications and gliding tendons often occur after surgery, the researchers tried to find a material that is able to effectively improve the tendon healing process. Platelet-rich plasma (PRP) and amniotic membrane are substances that have the potential to improve tendon healing processes, prevent adhesion and gliding tendons. However, research on the effects of the combination of both has never been done.
Methods: The Achilles tendon rupture model was carried out in 24 New Zealand white rabbits, which were divided into 4 treatment groups, namely the control group, the group with the administration of amniotic

membrane, the group with the administration of PRP and the group with the combination of amniotic membrane and PRP. The evaluation was carried out at 6 weeks after surgery based on an assessment of gliding tendon examination with ultrasound, Tang score macroscopic image of tendon adhesion, macroscopic adhesion grading, Tang score histopathological adhesion, histopathological adhesion grading, and Tensile strength tendon with the tensile test. The data obtained were tested statistically with the type of data and the number of groups.
Results: Amniotic membrane treatment group and combined amniotic membrane and PRP treatment group had significant differences in terms of gliding tendon by ultrasound, macroscopic and histopathological Tang scores and macroscopic and histopathological adhesion grading. The PRP treatment group and combined amniotic membrane and PRP treatment group showed significant differences compared to the control group in terms of tensile strength test values.
Conclusion: The administration of amniotic membrane can reduce the formed paratenon adhesion, however, it does not have statistical significance in influencing tendon strength. Giving Platelet-rich Plasma (PRP) does not affect the formation of paratenon adhesion statistically, but it affects the increase in tendon strength. The combination of amniotic membrane and PRP has a significant effect in reducing paratenon adhesion and increasing tendon strength.