Objective- To study functional, morphometrical and immunohistochemical assessment of nerve regeneration in a 10-mm rat sciatic nerve gap using biodegradable versus non-biodegradable nerve guides

Design- Experimental in vivo study

Animals- Seventy-two healthy male white Wistar rats

Procedures- The rats were divided into four experimental groups (n=18), randomly: Sham-operation (NC), Transected control (TC), biodegradable (BNG) and non-biodegradable (NBNG) nerve guide groups. In NC group after anesthesia the left sciatic nerve was exposed through a gluteal muscle incision and after careful homeostasis the muscle was sutured. In TC group the left sciatic nerve was exposed the same way, transected proximal to the tibio-peroneal bifurcation leaving a 10 mm gap. In BNG and NBNG groups the left sciatic nerve was transected the same way and proximal and distal stumps were each inserted into an inside-out vein and silicon grafts, respectively. Each group was further subdivided into three subgroups of six animals each and were studied 4, 12, and 16 weeks after surgery.

Results- Functional study, morphometric indices and immunohistochemistry indicated there was no significant difference (P>0.05) between groups in recovery of regenerated axons 4, 8, 12 and 16 weeks after surgery.

Conclusion and Clinical Relevance- Both techniques could be employed for bridging a nerve defect. However, it seems biodegradability of vein graft and no need for further operation to remove the graft makes it a more attractive graft in emerging field of regenerative medicine and surgery.

Key Words- Peripheral nerve regeneration, Biodegradable, Non-biodegradable, Nerve guide

References


Repair Society (ICRS) macroscopic grading and the O'Driscoll histological grading.

**Results**- Mean ICRS scores in the PRF treated group were consistently higher than the control group with significant difference observed at 4 (10.13 ± 0.99 vs. 8.37 ± 1.18) and 16 (9.5 ± 0.92 vs. 8.5 ± 0.53) weeks. Mean histological scores of the PRF treated group were also higher than the untreated group and significant difference was observed at 4 (9.62 ± 0.74 vs. 7.62 ± 1.99) and 24 (18 ± 3.7 vs. 13 ± 1.3) weeks. The resultant repair tissue was better in the PRF treated group.

**Conclusions and Clinical Relevance**- This study demonstrated that PRF could be used effectively to promote repair and regeneration of articular cartilage injuries.

**Key Words**- Platelet rich fibrin, Articular cartilage repair, Femoral condyle, Dog

**References**

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**Oral Presentation**

**Effect of Chitosan Tube Placement on Flexor Tendon Repair in Rabbits**

Alireza Yousefi¹, Farshid Sarrafzadeh-Rezaei¹, Amir Abbas Farshid², Behnam Heshmatian³, Mehdi Behfar¹

¹Department of Clinical Sciences, Faculty of Veterinary Medicine, Urmia University, Urmia, Iran.
²Department of Pathobiology, Faculty of Veterinary Medicine, Urmia University, Urmia, Iran.
³Department of Basic Sciences, Faculty of Medicine, Urmia University of Medical Sciences, Urmia, Iran.

**E-mail:** alireza.yousefi4@yahoo.com

**Objective** - Flexor tendon injuries still remain a challenging condition to manage to ensure optimal outcome for the patient. This study was conducted to investigate the effects of chitosan membrane on tendon adhesion and healing and obtain experimental data for its clinical application in preventing postoperative tendon adhesion.

**Design**- Original experimental study

**Animals**- Twenty four male New Zealand white rabbits

**Procedures**- Under general anesthesia, deep digital flexor tendon was aseptically exposed and a sharp full thickness tenotomy was performed on its middle third. After placing a modified Kessler suture with 3-0 nylon, in treatment group, a sterile chitosan tube was place on the tendon. While in control group, tendons were sutured alone. The operated limbs were immobilized using poly-cast for two weeks. Three and eight weeks post-operation, tendons were harvested at for quantitative histopathological evaluations. Adhesion to surrounding tissues was also evaluated qualitatively and scored.

**Results**- None of the animals presented side effects attributable to the implant. Histopathology revealed no changes between treatment and control groups in terms of vascularization, collagen alignment in both time points. However, chitosan tube significantly decreased tendon adhesion to surrounding tissues.

**Conclusion and Clinical Relevance**- Chitosan tube positively prevented the post-operative adhesion and maintained normal tendon gliding function without interfering tendon healing. The results of this study showed that chitosan tube can be used in combination with other healing enhancement therapies without any complication.

**Key Words**- Adhesion, Healing, Tendon, Chitosan

**References**

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**Oral Presentation**

**Peripheral Nerve Regeneration using PRP and Fetal Mice Brain Stem Cells in a Vascular Scaffold in Canine**

Parastoo Memarian*, Seifollah Dehghani Nazhvani

Department of Veterinary Surgery, School of Veterinary Medicine, Shiraz University, Shiraz, Iran.

**E-mail:** memarianp67@yahoo.com

**Objective**- The purpose of this study was to evaluate the effects of saphenous vein as a vascular graft substitute, PRP and stem cells derived from fetal mice brain in regeneration of the peripheral nerve in canine.

**Design**- Experimental study

**Animals**- Seven mix breed, adult dogs of both sexes.
**Osteogenic Medium with Bone Healing Properties: An Experimental Study**

Ahmad Oryan¹, Amin Bigham-Sadegh², Fatemeh Abbasi-Tehnizi³

¹DVM, PhD, Professor of Comparative Pathology, Department of Veterinary Pathology, School of Veterinary Medicine, Shiraz University, Shiraz, Iran.
²DVM, DVSc, Associate Professor of Veterinary Surgery, Faculty of Veterinary Medicine, Shahrekord, Iran.
³DVM, Research Assistant, Department of Veterinary Pathology, School of Veterinary Medicine, Shiraz University, Shiraz, Iran.
Email: dr.bigham@gmail.com

**Objective** - The present study has been designed in vivo to evaluate the effects of osteogenic medium on healing of experimental critical bone defect in a rabbit model.

**Design** - Experimental study

**Animals** - Twenty New Zealand albino rabbits, 12 months old, of both sexes, weighing 2.0±0.5 kg, were used in this study.

**Procedures** - Approximately a 10 mm segmental defect was created in the mid portion of each radius as a critical size bone defect. In the osteogenic medium group (n=5) 1 ml osteogenic medium, in maintenance medium group (n=5) 1 ml maintenance medium and in normal saline group (n=5) 1 ml normal saline were injected in the defected area while the defects of the rabbits of the control group (n=5) were left empty. Radiological evaluation was done on the 1st day and then at the 2nd, 4th, 6th and 8th weeks post injury. Biomechanical and histopathological evaluations were done on 8th weeks post injury.

**Results** - The radiological, histological and biomechanical findings of the present study indicate a superior bone healing capability in the osteogenic and maintenance medium groups, by the end of 8 weeks post-surgery, in comparison to the normal saline and control groups.

**Conclusion and Clinical Relevance** - In conclusion this study demonstrated that the osteogenic medium and maintenance medium could promote bone regeneration in long bone defects better than the control group in rabbit model.

**Key Words** - Osteogenic medium, Maintenance medium, Bone healing, Rabbit model

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**References**


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**Procedures** - The animals were anesthetized with acepromazin, ketamine and Diazepam. The medial aspect of elbow was prepared for aseptic surgery. The median nerve was exposed and a piece of 20 mm was excised. At the same time the area over the saphenous vein was prepared and a piece of 20 mm vein was removed. The two ends of the median nerve was sutured into the saphenous vein as a vascular conduit. An angiocat was installed into the conduit and the skin was sutured. About 1 ml of autogenous PRP was injected into the conduit in the first group and fetal mice brain stem cells as well as PRP was injected into the conduit of the second group. The control group did not receive any treatment. The animals were monitored clinically and histopathologically for three months.

**Results** - The results demonstrated that in both groups compared to the control group, the median nerve trunk had been reconstructed with restoration of nerve continuity and functional recovery, and its target skeletal muscle had been re-innervated, improving locomotion activities of the operated limb.

**Conclusion and Clinical Relevance** - This study proves the feasibility of the vascular conduit, PRP and stem cells derived from fetal mice brain in regeneration of the peripheral nerve in canine.

**Key Words** - Saphenous vascular autograft, Platelet rich plasma, Fetal mice brain stem cell, Median nerve defects, Dogs

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**References**

Effect of Tissue Engineered Based Hybridized Micro Structured Collagen Implant on Tendon Healing

Oryan A1, Moshiri A2, Meimandi Parizi A*2

1Department of Pathology, School of Veterinary Medicine, Shiraz University, Shiraz, Iran.
2Department Clinical Sciences, School of Veterinary Medicine, Shiraz University, Shiraz, Iran.
Email: meimandi@shirazu.ac.ir

Objective- We produced a novel tissue engineered, collagen based, bioimplant and its role was investigated on the healing of a large tendon defect model in rabbits.

Design- Experimental study

Animals - 30 New Zealand white rabbits.

Procedures- In the left Achilles tendon of rabbits a two cm gap was produced. The collagen implant was inserted in the tendon defect of the treatment group. The animals were euthanized at 60 days post injury and the macro—micro- morphologies and the biomechanical characteristics of the tendon samples were studied.

Results- A significant increase in number, diameter and density of the collagen fibrils, number and maturity of tenoblasts and tenocytes, alignment of the collagen fibrils and maturity of the elastic fibers were seen in the treated tendons when compared to the control ones (P < 0.05). Number of inflammatory cells, amount of peritendinous adhesions and muscle fibrosis and atrophy, were significantly lower in the treated lesions in comparison to control group (P < 0.05). Biomechanical parameters were significantly higher in treated group when compared to control one (P < 0.05).

Conclusion and Clinical Relevance- The collagen implant properly incorporated with the healing tissue and was replaced by the new tendinous structure. This study showed the hybridized micro structured collagen implant is a choice for treatment of tendon healing.

Key Words- Tissue engineering, Hybridized micro structure, Tendon, Healing

References

Oral Presentation

Resorption Rate of Block and Fascia-Wrapped Diced Cartilage Grafts in Rabbits: An Experimental Study

Mir Sepehr Pedram1, Saeed Farzad Mohajeris2, Roja Ebrahimi1, Mohammad Javad Fatemi2, Mohammad Esmaeel Hasani1, Shahram Rahimian1, Hamid Bateni2, and Seyed Jaber Mousavi2

1Department of Surgery and Radiology, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran.
2Department of Plastic and Reconstructive Surgery, Burn Research Center, Hazrat Fatemeh Hospital, Tehran University of Medical Sciences, Tehran, Iran.
Email: saeedfarzad@ut.ac.ir

Objective- Cartilage grafts have become an inherent part in plastic and reconstructive surgery, especially rhinoplasty. Classic autogenous cartilage harvesting techniques are associated with significant donor- and recipient-site morbidity. Application of cartilage micrografts wrapped in a sleeve was first developed to decrease the complication rates of block cartilage grafts. This study was designed to compare the resorption rate of solid block cartilage graft and diced cartilage wrapped in fascia graft in rabbits.

Design- Experimental study

Animals- Twelve 8-week-old male rabbits

Procedures- one solid block cartilage and one diced graft wrapped in fascia were implanted in right and left paraspinal subcutaneous pockets. By the end of the fourth month, the cartilage implants were harvested and photographed and weighed exactly. Then specimens were stained with hematoxylin and eosin to determine their architectural characteristics.

Results- Significant resorption of diced cartilage grafts wrapped in fascia was observed and the change was not statistically significant about solid block cartilage graft. In histopathologic examination, block cartilage grafts indicates viable cartilage but diced cartilage wrapped in fascia produced fibrosis and inflammatory cell infiltration.

Conclusion and Clinical Relevance- The range of resorption of the diced cartilage wrapped in fascia is considerable compared with one-piece block grafts. It may be anticipated that the avidity for this technique will decline once the long-term results of related clinical studies are available.

Key Words- Cartilage graft, Fascia-wrapped diced cartilage graft, Blocks cartilage graft
Iran. Faculty of Veterinary Medicine, University of Tehran, Tehran, energy production and utilization. While many of the threatening emergencies. Reduced blood flow or universal event in various forms of trauma and life-ischemic insult was prevented. Tissue ischemia is a salvaged when tissue necrosis associated with progressive early stage of the burns suggested that this zone could be reversible nature of tissue damage in this zone at the very ensues with progression of hypoxia and ischemia in 1-48 h, resulting in total loss of this intermediate zone. The irreversible nature of tissue damage in this zone at the very early stage of the burns suggested that this zone could be salvaged when tissue necrosis associated with progressive ischemic insult was prevented. Tissue ischemia is a universal event in various forms of trauma and life-threatening emergencies. Reduced blood flow or disturbed oxygen supply results in the discrepancy of energy production and utilization. While many of the factors determining the final fate of the cells are still poorly understood, some of these events have been clearly delineated. Among these changes, depletion of high-energy phosphates is the fundamental cause of tissue damage. Healthy cells must maintain a high content of ATP, and almost all energy-requiring processes in cells are driven, either directly or indirectly, by hydrolysis of ATP. Efforts to supplement ischemic cells with ATP have been ongoing for decades with little success. We have developed and used specially formulated, unilamellar lipid vesicles that contain magnesium-ATP for intracellular ATP delivery, and preliminary results indicate that this new energy delivery technique can provide a significant protective effect to ischemic tissues of zone of stasis in burn wounds. We report our encapsulation process and preliminary results with the new ATP delivery technique.

**Design-** An animal experimental study

**Animals-** We used 50 male Wistar rats, weighing 300-350 grams.

**Procedures-** We produced our Mg-ATP vesicles and measured the size and zeta-potential of vesicles by DLS (Dynamic Light Scattering) technique. We also took TEM image of the vesicles and measured the efficiency of our vesicles. We divided the rats in five groups each consisted of 10 rats. General anesthesia was induced with intramuscular injection of Ketamine 10%(90mg/kg) and Xylazine 2%(5mg/kg). The entire backs of the rats shaved and the procedure to create a “comb burn” model was carried out as described by Regas and Ehrlich. The brass comb was immersed into boiling water until thermal equilibrium was achieved. Then the heated brass block was placed on the back of each rat, 0.5cm lateral to the midline and held for 20s without any pressure. The same procedure was performed symmetrically, 15 min later, on the other side of rats back. The first group treated by hydrogel on their burn wounds and the second group by free-Mg-ATP in hydrogel and third group by free-vesicles in hydrogel and the forth treated by Mg-ATP-vesicles in hydrogel and the fifth group did not receive treatment. Dressing changes made every day. The old dressings removed and the wounds cleaned with cotton swabs to remove any fluids, clots, fibrins, residual drugs, and any tissue debris. Digital photos were taken, new dressings were applied, and the wounds were covered again. We assessed each zones of burn wounds by Laser Doppler flowmetry. The blood flows in the interspaces and burned and unburned areas (caudally at least 2cm distant from the burned areas) were measured before and after induction of burn injury just before the treatment. Measurements were repeated every day. We sacrificed 5 rats of each groups on day 3 and the others on day 21 and sent the skin samples for other analysis.

**Results-** Our analysis shows positive changes in zone of stasis in burn wounds.

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**References**


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**Oral Presentation**

**Encapsulating Mg-ATP in Vesicles and Applying to Enhance Burn Wound Healing in Rat**

Farzad Hayati*, Seyed Mehdi Ghamsari*, Ghasem Amoabedini*, Abbas Tavasoli*, Iradj Nowrouzian*

1Resident of Veterinary Surgery, Department of Surgery, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran.

2Professor of Veterinary Surgery, Department of Surgery, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran.

3Faculty of New Sciences and Technologies, University of Tehran, Tehran, Iran.

4Associated Professor of Veterinary Pathology, Department of Pathology, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran.

Email: Farzaddr81@yahoo.com

**Objective-** Burns are among the most devastating of all injuries. Burn injury is first and foremost an injury to the skin. Biological process acting to repair burn wounds has some differences from those acting to repair any other wounds. One of the most obvious differences between burn and disruptive or incisional wounds is in the effect of the injury upon blood vessels at the site of injury. In 1953 Jackson described three zones in burn wound based on the severity of destruction and blood flow alterations; zone of coagulation, zone of stasis and zone of hyperaemia. Soon after burn this pattern of tissue damage appears and persists for at least 24-48 h or longer in more severe burns. Investigations on the pathobiology of the zone of stasis revealed that irreversible tissue necrosis ensues with progression of hypoxia and ischemia in 1-48 h, resulting in total loss of this intermediate zone. The reversible nature of tissue damage in this zone at the very early stage of the burns suggested that this zone could be salvaged when tissue necrosis associated with progressive ischemic insult was prevented. Tissue ischemia is a universal event in various forms of trauma and life-threatening emergencies. Reduced blood flow or disturbed oxygen supply results in the discrepancy of energy production and utilization. While many of the factors determining the final fate of the cells are still poorly understood, some of these events have been clearly delineated. Among these changes, depletion of high-energy phosphates is the fundamental cause of tissue damage. Healthy cells must maintain a high content of ATP, and almost all energy-requiring processes in cells are driven, either directly or indirectly, by hydrolysis of ATP. Efforts to supplement ischemic cells with ATP have been ongoing for decades with little success. We have developed and used specially formulated, unilamellar lipid vesicles that contain magnesium-ATP for intracellular ATP delivery, and preliminary results indicate that this new energy delivery technique can provide a significant protective effect to ischemic tissues of zone of stasis in burn wounds. We report our encapsulation process and preliminary results with the new ATP delivery technique.
Conclusion and Clinical Relevance- According to our literature review; tremendous efforts have been aimed at preventing the conversion of the ischemic zone (zone of stasis) to full-thickness necrosis (zone of coagulation). Previous studies have shown that wound tissue relies heavily on the glycolytic pathway for energy production and both ATP and phosphocreatin (PCr) were severely decreased in ischemic zone. We hypothesized that ischemia in burn wounds results in low energy availability and this is one of the major causes of conversion of zone of stasis to zone of coagulation. Our results show delivery of Mg-ATP into the cytosol of cells of the zone of stasis, can enhance the healing process. To our knowledge, delivery the Mg-ATP to zone of stasis is the first study and new method in burn wound treatment.

Key Words- Mg-ATP vesicles, Intracellular delivery, Zone of stasis, Ischemia, Burn wound healing

References

Poster Presentation

Histopathological Evaluation of the Effect of Platelet-rich Fibrin on Canine Cutaneous Incisional Wound Healing

Majid Khanzadeh Alishahi1, Davoud Kazemi2

1Department of Veterinary Medicine, Young Researchers Club, Mashhad, Iran.
2Department of Veterinary Clinical Sciences, Faculty of Veterinary Medicine, Tabriz Branch, Islamic Azad University, Tabriz, Iran.

Email: majid.khanzadeh@yahoo.com

Objective- Platelets are a natural source of growth factors and cytokines that promote wound healing, and platelet-rich fibrin contains concentrated growth factors. Growth factors in platelet-rich fibrin may promote wound repair.

Design- In this original study the effect of platelet-rich fibrin was evaluated in a dog model of cutaneous incisional wounds using histology and semi-quantitative evaluation.

Animals-15 healthy 1 year old (13 male and 2 female) mixed breed dogs with 20 kilograms of weight were used in this study.

Procedures- A pair of ten centimetre full-thickness parallel linear cutaneous wounds were created on the backs of 15 dogs on the both sides of vertebral column. On the left side the platelet-rich fibrin clot was applied to the edges of the wound (Treatment group) and the right side received nothing (Control group). All wounds were then closed with 3-0 non-absorbable Nylon suture. The dogs were divided into three groups of five dogs. The wound tissues were sampled by electrosurgery in group one after 3 days, group two after 7 days and group three after 14 days post surgery. For each specimen, histopathological examination and semi-quantitative evaluation was performed by light microscopy using Hematoxylin & Eosin and Masson’s trichrome staining.

Results- Histopathological examination and semi-quantitative evaluation demonstrated differences in wound healing progress among the three groups.

Conclusion and Clinical Relevance- This study demonstrates that PRF accelerates incisional wound healing. This is supported by the semi-quantitative analysis and histological demonstration of the accelerated epithelialization seen in PRF-treated incisional wounds.

Key Words- Platelet-rich fibrin, Wound healing, Cutaneous wound

References

Poster Presentation

Ketoprofen Combined with Artery Graft Entubulization Improves Functional Recovery of Transected Peripheral Nerves

Nima Nikonom1, Rahim Mohammadi1, Moein Mehrtash2, Moied Mehrtash1, Keyvan Amini3

1Department of Clinical Sciences, Faculty of Veterinary Medicine, Urmia Branch, Islamic Azad University, Urmia, Iran.
2Department of Clinical Sciences, Faculty of Veterinary Medicine, Urmia University, Nazloo Road, Urmia, Iran.
3Department of Veterinary Pathology, Western College of Veterinary Medicine, University of Saskatchewan, 52 Campus Drive, Saskatoon, Saskatchewan S7N5B4, Canada.
Email: nnikonom@yahoo.com
Objective- The objective was to assess the local effect of ketoprofen on sciatic nerve regeneration and functional recovery.

Design- The Type of the design must be noted, e.g. Descriptive study and ….

Animals- Eighty healthy male white Wistar rats

Procedures- Eighty healthy male white Wistar rats were randomized into four experimental groups of 20 animals each: In the transected group (TC), the left sciatic nerve was transected and nerve cut ends were fixed in the adjacent muscle. In the treatment group the defect was bridged using an artery graft (AG) filled with 10 microliter ketoprofen (0.1 mg/kg). In the artery graft group (AG), the graft was filled with phosphated-buffer saline alone. In the sham-operated group (SHAM), the sciatic nerve was exposed and manipulated. Each group was subdivided into four subgroups of five animals each and regenerated nerve fibres were studied at 4, 8, 12 and 16 weeks post operation.

Results- Behavioural testing, sciatic nerve functional study, gastrocnemius muscle mass and morphometric indices showed earlier regeneration of axons in AG/Keto than in AG group (p < 0.05). Immunohistochemical study clearly showed more positive location of reactions to S-100 in AG/Keto than in AG group.

Conclusion and Clinical Relevance- When loaded in an artery graft, ketoprofen improved functional recovery and morphometric indices of the sciatic nerve. Local usage of this easily accessible therapeutic medicine is cost saving and avoids the problems associated with systemic administration.

Key Words- Nerve repair, Sciatic, Ketoprofen, Topical

References

Poster Presentation

Hydroalcoholic Extract of Oak (Quercus infectoria) Acorn Shell Enhances Healing of Full-thickness Wounds in Rats

Hawdam Rostami¹, Rahim Mohammadi¹, Rahim Hobbenaghi²

¹Department of Clinical Sciences, Faculty of Veterinary Medicine, Urmia University, Nazloo Road, Urmia, Iran.
²Department of Pathobiology, Faculty of Veterinary Medicine, Urmia University, Nazloo Road, Urmia, Iran.

Email: hawdamrostami@yahoo.com

Objective- This study was designed to elucidate the in vivo efficacy of hydroalcoholic extract of oak (Quercus infectoria) acorn shell on full-thickness wound healing in rats

Design- Experimental in vivo study

Animals- Sixty healthy male white Wistar rats

Procedures- The rats were divided into five groups of 12 rats each: Control group (CG) with creation of wounds and no treatment, base formulation group (BFG) with creation of wounds and application of base formulation ointment, treatment group (TG1) with 1g of powder extract of the plant material in ointment, treatment group (TG2) with 2g and treatment group (TG4) with 4g of powder extract of the plant material in ointment. Wound size was measured on 3, 5, 7, 9, 11, 13 and 15 days, and Histologic evaluation was performed on 7, 14 and 21 days of post-surgery. Hydroxyproline contents of wounds were determined on day 21 post surgery. Biomechanical testing was performed on day 9 post surgery in incisional model.

Results- Reduction in wound area, histological findings, hydroxyproline contents and Biomechanical parameters indicated there was significant difference (P<0.05) between group TG4 and other groups.

Conclusion and Clinical Relevance- Hydroalcoholic extract of oak (Quercus infectoria) acorn shell especially ointment 4% may has beneficial effects on wounds repair as in vivo experimental wound models in rat, and it could be suggested for treating various types of wounds in animal and human beings.

Key Words- Quercus infectoria, Hydroalcoholic extract, Wound healing, Full-thickness wounds, Rat

References
Conclusions and Clinical Relevance—

Fertilization rate along with poor blastocyst formation. The current findings suggest that UBTT has detrimental effects on contralateral epididymal sperm fertilizing capacity which resulted in marked reduction in fertilizing capacity of mice undergoing UBTT. The current study was thus designed to explore contralateral epididymal sperm fertilizing capacity of mice undergoing UBTT. This study was thus designed to explore contralateral epididymal sperm fertilizing capacity of mice undergoing UBTT. This study was thus designed to explore contralateral epididymal sperm fertilizing capacity of mice undergoing UBTT.

Objective—Blunt testicular trauma occurs most commonly as a result of assault or sport. Effects of unilateral blunt testicular trauma (UBTT) on the contralateral testis and fertility are still a matter of debate. This study was thus designed to explore contralateral epididymal sperm fertilizing capacity of mice undergoing UBTT.

Design—Experimental study (in vitro)

Animals—Twelve Male NMRI mice aged 20 days were randomized into two equal groups each of six.

Procedures—Following anesthesia with intraperitoneal injection of ketamine (40 mg kg⁻¹) and xylazine (5 mg kg⁻¹), mice in group I (control) were sham operated without disturbing either testis. In group II (UBTT), the abdomen was opened and the right testis was placed on a sterile firm surface and 5 g sterile weight was dropped on to the testis from a height of 10 cm. At 70 days of age the animals in experimental groups: In control group, surgical bone defect was created in the body of the mandible. In Scaffold group (Scaffold) the defect was implanted with a chitosan scaffold. In Scaffold/SVF group, the scaffold was implanted and seeded with 10 µl SVF aliquots (2.19 ± 0.43 × 10⁷ cells).

Results—Unilateral blunt testicular trauma induced defectin contralateral epididymal sperm fertilizing capacity which resulted in marked reduction in fertilization rate along with poor blastocyst formation.

Conclusion and Clinical Relevance—The current findings suggest that UBTT has detrimental effects on contralateral epididymal sperm in vitro fertilizing capacity, possibly through immunological responses.

Key Words—Fertility, Mouse, Sperm, Trauma

References


Poster Presentation

Effect of Experimental Unilateral Blunt Testicular Trauma on Contralateral Epididymal Sperm Fertilizing Capacity in Mice

Reza Moenini Moghaddam¹, Ali Shalizar Jalali², Gholamreza Najafi¹, Mehdi Behfar*²

¹Department of Basic Sciences, Faculty of Veterinary Medicine, Urmia University, Urmia, Iran.
²Department of Clinical Sciences, Faculty of Veterinary Medicine, Urmia University, Urmia, Iran.
Email: m.behfar@gmail.com

Objective—Blunt testicular trauma occurs most commonly as a result of assault or sport. Effects of unilateral blunt testicular trauma (UBTT) on the contralateral testis and fertility are still a matter of debate. This study was thus designed to explore contralateral epididymal sperm fertilizing capacity of mice undergoing UBTT.

Design—Experimental study (in vitro)

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Results—Unilateral blunt testicular trauma induced defect in contralateral epididymal sperm fertilizing capacity which resulted in marked reduction in fertilization rate along with poor blastocyst formation.

Conclusion and Clinical Relevance—The current findings suggest that UBTT has detrimental effects on contralateral epididymal sperm in vitro fertilizing capacity, possibly through immunological responses.

Key Words—Fertility, Mouse, Sperm, Trauma

References


Poster Presentation

Bone-guided Regeneration of Mandibles Using Chitosan Scaffold Seeded with Characterized Uncultured Omental Adipose Derived Stromal Vascular Fraction

Rahim Mohammadi*¹, Keyvan Amini²

¹Department of Clinical Sciences, Faculty of Veterinary Medicine, Urmia University, Iran.
²Department of Veterinary Pathology, Western College of Veterinary Medicine, University of Saskatchewan, Canada.
Email: r.mohammadi@urmia.ac.ir

Objective—Dramatic changes in bone tissue, when injured, limit the ability to perform basic tasks and frequently cause social and psychological problems. The aim of the present study was to assess effect of chitosan scaffold seeded with characterized uncultured omental adipose derived stromal vascular fraction (SVF) on bone regeneration using a circular mandibular bone defect.

Design—Experimental in vivo study

Animals—Seventy-five male healthy white Wistar rats

Procedures—rats were randomized into three experimental groups: In control group, surgical bone defect was created in the body of the mandible. In Scaffold group (Scaffold) the defect was implanted with a chitosan scaffold. In Scaffold/SVF group, the scaffold was implanted and seeded with 10 µl SVF aliquots (2.19 ± 0.43 × 10⁷ cells).

Results—Microscopic and histomorphometric analyses showed improved and earlier regeneration of bone defect in Scaffold/SVF group (p < 0.05).

Conclusion and Clinical Relevance—SVF could be considered as a readily accessible source of stromal cells that improve bone regeneration because of reduction in the interval from tissue collection until cell injection and simplicity of laboratory procedure, especially where a traumatic injury is dealt with. In view of the increase in the life expectancy of human being, the present animal model study could be of clinical interest for the relevance of bone repair in the craniofacial region in osteoporotic cases.
Key Words- Bone regeneration, Mandible, Uncultured SVF, Chitosan scaffold

References

Poster Presentation

Efficacy of Cyclosporine in the Prevention of Contralateral Epididymal Sperm Deterioration in Experimental Unilateral vas Deferens Obstruction

Mehdi Behfar1, Ali Shalizar Jalali2, Ghomamreza Najafi2, Siamak Ghomalipour1
1Department of Clinical Sciences, Faculty of Veterinary Medicine, Urmia University, Urmia, Iran.
2Department of Basic Sciences, Faculty of Veterinary Medicine, Urmia University, Urmia, Iran.
Email: m.behfar@gmail.com

Objective- Acquired unilateral obstruction of vas deferens may be iatrogenically occur after inguinal herniorrhaphy, varicocelectomy, lower ureteral lithotomy, or cryptorchidism repair and fixation. It is known to affect contralateral testicular germ cell maturation through autoimmunity. The present study was performed to evaluate the therapeutic efficacy of cyclosporine (Cs), a powerful immunosuppressive agent, in terms of preventing contralateral epididymal sperm impairment induced by unilateral vas deferens obstruction (UVO) in mice.

Design- Experimental study

Animals- Twenty four Adult male mice were randomly assigned to four experimental groups each of six.

Procedures- Mice were aseptically undergone to UVO under anesthesia with intraperitoneal injection of ketamine (40 mgkg-1) and xylazine (5 mgkg-1). The obstruction was induced by left vas deferens ligation using 4/0 silk suture 2 cm from the epididymis. One of these groups received Cs (10 mgkg-1 per day) orally for 7 days starting from the day of induction of experimental UVO. Corresponding control groups, including sham operation group and obstruction without treatment, were also included. Six intact mice were also treated with Cs. Five weeks after operation, contralateral epididymal sperm analyses were carried out at.

Results- Unilateral vas deferens obstruction resulted in significant decrease in contralateral epididymal sperm concentration, viability and motility; however, Cs treatment significantly preserved normal sperm quantity and quality of the contralateral epididymis, compared with the UVO group.

Conclusion and Clinical Relevance - These findings suggest that Cs treatment can attenuate detrimental effects of UVO on contralateral epididymal sperm, possibly through blockade of cell-mediated autoimmune response.

Key Words- Cyclosporine, Mouse, Sperm, Vas deferens

References

Poster Presentation

Comparative Study of the Bone Morphogenic Protein and Hydroxyapatite Used in Combination with Platelet Rich Plasma in Bone Healing in Rabbits

Seyyedeh Pantea rahnama*, Donya Vaghefi1, Fateme Namazi2 and Seifollah N. Dehghani1
1Department of Veterinary Surgery, School of Veterinary Medicine, Shiraz University, Shiraz, Iran.


**Objective** - To compare the stimulating effects of the Bone Morphogenetic Protein (BMP) and Hydroxyapatite on Plate Rich Plasma (PRP) to enhance the bone healing in the radius fracture gap in rabbits.

**Design** - Experimental study

**Animals** - 16 adult white New Zealand rabbits were used in this study.

**Procedures** - Under general anesthesia and following aseptic conditions one centimeter of radius was removed. Then they were divided into 4 groups. Group 1 received PRP, group 2 received PRP and BMP, group 3 received PRP and Hydroxyapatite and group 4 served as control.

**Results** - The radiological investigation on 26 days post op showed that the radius gap was more than 80% covered by new bone formation in group 2 and 3 compared to group 1 and 4. The group 1 was better than the control group. Histopathological results showed significant differences in bone healing quality in group 2 and 3 compared to control. The group 1 was superior to group 4.

**Conclusion and Clinical Relevance** - Stimulating effects of BMP and hydroxyapatite on PRP has induced solid bone formation and faster bone healing.

**Key Words** - Bone healing, PRP, BMP, Hydroxyapatite, Rabbit, Radius bone

**References**


**Poster Presentation**

**Conventional versus Reverse Nerve Grafting for Peripheral Nerve Repair in Lower Extremity of Rats**

Mirspehr Pedram1, Shaghayegh Rafatpanah*1, Zahra Saffarian1, Hossein Akbari2, Mohammad Javad Fatemi2, Zohrab Shakour3, Seyed Jaber Mousavi4, Pejman Madani5

1Department of Surgery and Radiology, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran.
2Department of Plastic and Reconstructive Surgery, Hazrat Fatemeh Hospital and Burn Research Center, Tehran University of Medical Science, Tehran, Iran.
3Department of Plastic and Reconstructive Surgery, Hazrat Fatemeh Hospital, Tehran University of Medical Science, Tehran, Iran.
4Department of Community Medicine Specialist, Hazrat Fatemeh Hospital, Tehran University of Medical Science, Tehran, Iran.
5Department of Rehabilitation, Hazrat Fatemeh Hospital, Tehran University of Medical Science, Tehran, Iran.

**Objective** - Utilizing the patient’s own nerve (auto graft) is the preferred method of nerve transplantation in some nerve injuries where the possibility of end-to-end repair is absent. The potential prevention of axonal growth into nerve branches due to reverse nerve grafting is theoretically legitimate, thus a greater number of axons will reach the target organ. The current study focuses on comparison of conventional versus reverse nerve grafting.

**Design** - This study was an experimental study performed in Animal laboratory of Hazrat Fatemeh Hospital from April till August 2011.

**Animals** - Forty male, adult Wistar rats were divided randomly into 2 groups and underwent surgery.

**Procedures** - The sciatic nerve of the right leg was incised 1.5cm and anastomosed directly in the first and reversely in the second group between the proximal and distal ends of the nerve. On weeks one and sixteen after the surgery the rats’ footprints were recorded. On week sixteen pathologic examination and axon count was conducted. The results of these two methods were compared clinically based on sciatic functional index and para clinically based on axon count. A p-value smaller than 0.05 was considered statistically significant.

**Results** - Employing the conventional and the reverse nerve grafting techniques proved no significant difference, neither from a clinical point of view; week one (P= 0.22%) and week sixteen (P= 0.87%), nor from a para clinical point of view; SFI and axon count on week sixteen (P=0.68).

**Conclusion and Clinical Relevance** - No significant clinically or para clinically differences between two approaches were observed. It should be considered that the diameter and length of nerves and muscles in human is larger than rats, therefore the results of nerve repair may be different in human. A study in an animal model more anatomically similar to human is recommended.

**Key Words** - Conventional nerve graft, Foot print, Functional index, Nerve graft, Reversed nerve graft, Sciatic

**References**

**Local Administration of Platelet Derived Growth Factor B on Functional Recovery of Peripheral Nerve Regeneration: A Sciatic Nerve Transection Model**

Atefeh Golzadeh*, Rahim Mohammadi

Department of Clinical Sciences, Faculty of Veterinary Medicine, Urmia University, Urmia, Iran.

Email: atefeh_golzadeh@yahoo.com

**Objective-** To study effects of platelet derived growth factor B (PDGF B) on peripheral nerve regeneration in a rat sciatic nerve transection model

**Design-** Experimental in vivo study

**Animals-** Forty-five healthy male white Wistar rats

**Procedures-** The rats were divided into three experimental groups (n=15), randomly: Normal control group (NC), silicon group (SIL), PDGF B treated group (SIL/PDGF). In NC group left sciatic nerve was exposed through a gluteal muscle incision and after homeostasis muscle was sutured. In the SIL group the left sciatic nerve was exposed the same way and transected proximal to tibio-peroneal bifurcation leaving a 10-mm gap. Proximal and distal stumps were each inserted into a silicone conduit and filled with 10 µL phosphate buffered solution. In SIL/PDGF group the silicon conduit was filled with 10 µL PDGF B (0.5 ng/mL). Each group was subdivided into three subgroups of five animals each and were studied 4, 8, 12 weeks after surgery.

**Results-** Behavioral testing, sciatic nerve functional study, gastrocnemius muscle mass showed earlier regeneration of axons in SIL/PDGF than in SIL group (p < 0.05).

**Conclusion and Clinical Relevance-** Administration of PDGF B combined with silicon grafting could accelerate functional recovery after nerve and may have clinical implications for the surgical management of patients after nerve transection.

**Key Words-** Peripheral nerve repair, Sciatic, Platelet derived growth factor, Local, Rat

**References**


**Poster Presentation**

**Platelet Rich Plasma Locally Improves Functional Recovery after Bridging Sciatic Nerve Defect Using Silicone Rubber Chamber**

Sedighe Abbasipour-Dalivand*, Rahim Mohammadi, Vahid Mohammadi

Department of Clinical Sciences, Faculty of Veterinary Medicine, Urmia University

E-mail: saeideabbasipour@gmail.com

**Objective-** Effects of platelet rich plasma (PRP) on peripheral nerve regeneration was studied using a rat sciatic nerve transection model.

**Design-** Experimental in vivo study

**Animals-** Forty-five male white Wistar rats

**Procedures-** Forty-five male white Wistar rats were randomized into three experimental groups (n = 15): Normal control group (NC), silicon group (SIL), PRP treated group (SIL/PRP). In NC group left sciatic nerve was exposed through a gluteal muscle incision and after homeostasis muscle was sutured. In SIL group left sciatic nerve was exposed the same way and transected proximal to tibio-peroneal bifurcation leaving a 10-mm gap. Proximal and distal stumps were each inserted into a silicone conduit and filled with 10 µL phosphate buffered solution. In SIL/PRP group silicon conduit was filled with 20 µL PRP. Each group was subdivided into three subgroups of five animals each and were studied 4, 8, 12 weeks after surgery.

**Results-** Behavioral testing, sciatic nerve functional study and gastrocnemius muscle mass showed earlier regeneration of axons in SIL/PRP than in SIL group (p <0.05).

**Conclusion and Clinical Relevance-** Local administration of PRP combined with silicon grafting could accelerate functional recovery of peripheral nerve. Easily available growth factors and bioactive proteins present in PRP may have clinical implications for the surgical management of patients after nerve transection.
Tissue Engineering and Experimental Surgery

Key Words- Peripheral nerve repair, Sciatic, Platelet rich plasma, Local, Functional recovery

References

Poster Presentation

The Evaluation of Topical Administration of Different Doses of Lint Bells Oil Ointment on Circular Excision Wound Healing in Experimental Animals

Mohammad Reza Farahpour*

Assistant professor, Department of Clinical Sciences, Urmia Branch, Islamic Azad University, Urmia, Iran.
Email: mrf78s@gmail.com

Objective- This study aimed to investigate the effect of topical administration of lintbells oil on wound contraction as well as a healing process.

Design- Experimental in vivo study

Animals- in order to follow-up current study, 60 Male Swiss albino mice were used.

Procedures- Animals were randomly divided into 5 groups (NO=12) including; vehicle-received negative control, pure oil-received and test group. The animals in the test group subdivided into two groups as 2% cream-treated (LBOC 2%) and 4% cream-treated (LBOC 4%). Two circles-shapes-full thickness surgical wounds, in both sides of the backbone, 1 cm away from the backbone and 2 cm away from each other were made with a biopsy punch (5 mm). Using graph paper, the Percentage of wound contraction measured at 3rd, 6th, 9th and 12th days after surgery. Tissue samples were obtained at the end of day 3rd, 6th and12th from all groups and stained with Masson’s trichrome and then reviewed under light microscope.

Results- Treated groups LBOC significantly shortened the healing process, which was revealed by rapid diminishing of the wound area. Histological observations revealed that, LBOC in form of 2% formulation remarkably reduced inflammatory cells infiltration, enhanced collagen deposition and fascinated the epithelialization versus other groups.

Conclusion and Clinical Relevance- In conclusion, our data showed that lint bells oil in 2% form administration promotes wound contraction ratio and fascinated the healing processes by inhibiting the inflammatory stage and stimulating the proliferation rate.

Key Words- Lint bells oil, Wound healing, Contraction, Histopathology, Mice

References

Poster Presentation

Histopathological Evaluation of β-tricalcium Phosphate (HA+ β-TCP) Granol Potential for Healing of Segmental Femur Bone Defect in Rat

Hadi Eftekhari1, Mohammad Reza Farahpour*2

1Department of Clinical Sciences, Urmia Branch, Islamic Azad University, Urmia, Iran.
2Assistant professor, Department of Clinical Sciences, Urmia Branch, Islamic Azad University, Urmia, Iran.
Email: mrf78s@gmail.com

Objective- Histopathological evaluation of β-tricalcium phosphate (HA+ β-TCP) granol demonstrated that it bears healing properties on segmental femur bone defect in rat.

Design- Experimental in vivo study

Animals- In this study on 45 male Wistar-albino rats (weight 230±10 g). Animals were divided into three groups of 15 rats each: pure β-tricalcium phosphate granules, hydroxyapatite and third group considered as the control group and no treatment.

Procedures- Surgical procedures were done after IP administration of ketamine 5% and xylazine HCL 2%, then an approximately a 5 mm long, 3 mm deep and 2 mm wide bone defect was created in the femur of one hind limbe using a no. 0.14 round bur. Histopathological evaluation was performed in 15, 30 and 45 post days after surgery. At the 45th day post-surgery, quantity of newly
formed lamellar bone at healing site in β-TCP group was better than onward compared to HA and Control groups.

**Results**- In the treatment, β-TCP showed a bone healing effect with nearly filled by newly formed compact trabecular bone, remodeling and consolidation developing haversian system, compared control group.

**Conclusion and Clinical Relevance**- In conclusion β-tricalcium phosphate (β-TCP) granules exhibited a reproducible bone healing potentials.

**Key Words**- Bone healing, β-tricalcium phosphate (β-TCP), Hydroxyapatite (HA), Histopathological evaluation, Rats

**References**


**Poster Presentation**

**Topical Application of Thyme Oil Accelerates Infected Wound Healing**

Arvin Rahamapour1 and Mohammad Reza Farahpour*2

1Department of Clinical Sciences, Urmia Branch, Islamic Azad University, Urmia, Iran.

2Assistant professor, Department of Clinical Sciences, Urmia Branch, Islamic Azad University, Urmia, Iran.

Email: mrf78s@gmail.com

**Objective**- Candida albicans is an opportunistic pathogen and it can transform to invade form in appropriate conditions. Thyme oil contains as thymol and carvacrol that have been found in antibacterial activity. The aim of the present work was to investigate the in vivo antifungal activity of the topical effect of Thyme essential oil on the infected skin wound with Candida albicans on rats.

**Design**- Experimental in vivo study

**Animals**- In this study on 45 male Wistar rats (weight 210±10 g). Animals were divided into three groups of 15 rats each: control, ointment 1.5% and 3% Thyme oil. All animals were randomly distributed into 5 subgroups of 3 rats each group.

**Procedures**- After general anesthesia, and an excisional wound square with dimensions 1.5 in the 1.5 cm area between the shoulders, immediately was applied to the wound 0.1 ml of the suspension containing 1.5×10⁷ CFU Candida albicans. During the project was obtained, the end of days 4th, 8th, 12th, 16th and 20th from wounds of different groups, Photographs were taken to assess ulcer size image, as well as tissue samples to estimate the number of yeast colonies.

**Results**- In the excision wound model, Thyme oil at clinical relevant neither dose promoted infected wound healing with significantly reduce the wound contraction (p< 0.05) and also colonies forming of Candida yeast (p <0.01).

**Conclusion and Clinical Relevance**- Be considered this herbal formula, accelerate infected wound healing with Candida albicans and better choice to use a topical ointment containing 3% Thyme oil.

**Key Words**- Candida albicans, Thyme oil, Infected wound, Wound contraction, Rat

**References**


**Poster Presentation**

**Effect of topical Pistacia Atlantica Extracts on Full-thickness Wounds in Rats**

Jamal Doost Mohammadi1, Mahmood Ebrahimzadeh1, Mohammad Reza Farahpour*2

1Department of Clinical Sciences, Urmia Branch, Islamic Azad University, Urmia, Iran.

2Assistant professor, Department of Clinical Sciences, Urmia Branch, Islamic Azad University, Urmia, Iran.

Email: mrf78s@gmail.com

**Objective**- This study was conducted to evaluate effects of topical application of the Pistacia atlantica extract on wound healing and histology of the healing wound in rats.

**Design**- Experimental in vivo study

**Animals**- 48 male Wistar rat were divided into 4 groups of 12 rats each: Control, placebo and therapeutic forms in tow doses, 2% and 4%, based on Eucerin-Vaseline as an ointment and pure oil groups (PEO).
Procedures- One circle-shapes, full thickness surgical wounds, in the backbone, were made with a scalpel and surgical scissors. Percentage of wound contraction measured at 3rd, 6th, 9th, 12th, 15th and 21th days after surgery, with graph paper. Tissue samples were obtained at the end of day 4th, 7th, 14th and 21 days after wound induction, from all groups and stained with Masson’s trichrome stain reviewed under light microscope.

Results- Treated groups with PEO, showed a significant wound healing effect in reducing wound area (p< 0.05). Also Histological study showed in experimental groups, especially high concentration of Pistacia atlantica extract (PEO 4%), less polymorph nuclear cell, more mast cell, collagen deposit and re-epithelialization compared to control group.

Conclusion and Clinical Relevance- The experimental data revealed that Pistacia atlantica extract ointment 4%, showed significant non-infected wound healing effect.

Key Words- Pistacia atlantica, Wound healing, contraction, Histological study, Rat

References

Poster Presentation

Tendon Injury Healing with Fibroblast and Static Magnetic Field in Rabbit Model: Biomechanical and Histopathological Evaluation

Setareh Ghasemi¹, Amin Bigham-Sadegh², Iraj Karimi¹, Pezhman Mirshokraei¹, Ahmad Yousefi³, Nazari Hasan⁴

¹Department of Clinical Science, School of Veterinary Medicine, University of Tehran, Tehran, Iran.
²Department of Clinical Science, Faculty of Veterinary Medicine, Shahrekord University, Sharekord, Iran.
³Department of Pathobiology, Faculty of Veterinary Medicine, Shahrekord University, Sharekord, Iran.
⁴Department of Clinical Science, Faculty of Veterinary Medicine, Ferdowsi University of Mashhad, Mashhad, Iran.
⁵Graduated student, Faculty of Veterinary Medicine, Shahrekord University, Shahrekord, Iran.
⁶Ph.D Student of Reproduction Biotechnology, Research Centre of Animal Embryo Technology, Shahrekord University, Shahrekord, Iran.
Email: setareh.ghasemi@ut.ac.ir

Objective-Tendons are highly subjected to injury. Fibroblast is one of the cells used in tendon healing; however, there’s no proved and reported result in regard to their use in tendon healing. In addition, there are some studies done on the effect of magnetic fields on tendon healing but the results are antithesis. The aim of this study is to evaluate the effect of simultaneous application of fibroblast and magnetic field on tendon healing in rabbit model.

Design- Experimental study

Animals- Nine healthy, adult New Zealand White rabbits

Procedures- Both legs of rabbits were divided into 6 groups named empty, magnet, culture substance, culture substance-magnet, fibroblast, and fibroblast-magnet. After skin incision, superficial flexor tendon was exposed and cut transversely and then sutured with nylon 2/0 suture and Bunnel-Mayer stitch pattern. In three rabbits, 0.5 cc culture substance and in three others, 0.5 cc culture substance and fibroblast were injected in the incision area. Then all injuries were dressed up and in all rabbits, a piece of magnet was placed in the surrounding bandage of left leg for 7 days. After 3 months, rabbits were euthanized, tendons were extracted and biomechanical tests and histopathological tests were performed.

Results- Only one of the biomechanical features (Ultimate Strength) showed a statistically significant difference (P<0.05) which in fibroblast-magnet group was better than other groups. Also, in histopathological evaluation fibroblast-magnet group showed better result in comparison with others.

Conclusion and Clinical Relevance- In conclusion, simultaneous use of fibroblast cells and magnetic field has a positive effect on tendon healing, both histologically and biomechanically in animal model.

Key Words- Tendon healing, Biomechanics, Fibroblast, Static magnet

References

Proceeding of the 4th International Symposium of Veterinary Surgery (ISVS)
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Evolution of Securigera Extract on Excisional Wound Healing in Diabetic Mice

Amir Soltanian 1, Mohammad Reza Farahpour 2

1 Department of Clinical Sciences, Urmia Branch, Islamic Azad University, Urmia, Iran.
2 Assistant professor, Department of Clinical Sciences, Urmia Branch, Islamic Azad University, Urmia, Iran.

Email: mrf78s@gmail.com

Objective- This study was conducted to evaluate effects of topical application of Securigera seed extract on wound healing in diabetic mice.

Design- Experimental in vivo study

Animals- 30 male Swiss albino mice were divided into 4 groups of mice each: Control, placebo and therapeutic forms in tow doses, 5% and 10%, based on Eucerin-Vaseline as an ointment (SEO).

Procedures- Two circle-shapes, full thickness surgical wounds, in both sides of the backbone, 1 cm away from the backbone and 5 cm away from each other were made with biopsy punch 4 mm. Percentage of wound contraction measured at 3rd, 6th, 9th, 12th and 15th days after surgery, with a camera. Tissue samples were obtained at the end of day 3rd, 6th and 12th from all groups and stained with Masson’s trichrome stain reviewed under light microscope.

Results- Treated groups SEO, especially SEO 10%, showed a significant wound healing effect in reducing wound area (< 0.05). Also Histological study showed in experimental groups, especially low concentration of lint bells oil, pharmaceutical formulation (SEO 10%), less inflammatory cell, more collagen deposit and re-epithelialization compared to control group.

Conclusion and Clinical Relevance- The experimental data revealed that pharmaceutical formulations of Securigera seed extracts showed a significant wound healing effect in diabetic mice.

Key Words- Securigera seed extracts, Wound healing, Diabetic mice

References
Combination of Cinnamon Extract and Flaxseed Oil Accelerate Full-thickness Wound Healing in Rabbit

Majid Ghafoori¹, Mohammad Reza Farahpour*²

¹Department of Clinical Sciences, Urmia Branch, Islamic Azad University, Urmia, Iran.
²Assistant professor, Department of Clinical Sciences, Urmia Branch, Islamic Azad University, Urmia, Iran.
Email: mrf78s@gmail.com

Objective- This study was conducted to evaluate effects of topical application of the combination of cinnamon extract and flaxseed oil on wound healing and histology of the healing wound in mice.

Design- Experimental in vivo study

Animals- 36 New Zealand white rabbits were divided into 4 groups of 9 rabbits each: Control, placebo and therapeutic forms in tow doses, flaxseed oil 2% (F2%) and combination of cinnamon extract and flaxseed oil 2% (CF2%), based on Eucerin-Vaseline as an ointment and pure oil groups.

Procedures- Two square-shapes, full thickness surgical wounds with 1.5 cm wide, in both sides of the backbone, 1 cm away from the backbone and 5 cm away from each other were made with a scalpel and surgical scissors. Percentage of wound contraction measured at 4th, 8th, 12th, 16th and 20th days after surgery, with graph paper. Tissue samples were obtained at the end of day 4th, 8th and 20th from all groups and stained with Masson’s trichrome stains reviewed under light microscope.

Results- Treated groups, especially group CF2% showed a significant wound healing effect in reducing wound area (P<0.05). Also Histological study showed in experimental groups, especially group CF2%, better collagen deposit and re-epithelialization compared to control group.

Conclusion and Clinical Relevance- The experimental data revealed that pharmaceutical formulations of combination of cinnamon extract 2% and flaxseed oil 2% (CF2%), showed significant non-infected full-thickness wound healing effect.

Key Words- Cinnamon extract, Flaxseed oil, Wound healing, Rabbits

References

**Poster Presentation**

**Use of Ethyl Alcohol in Induction of Experimental Osteoarthritis**

Behrooz Nikahval1, Nasrollah Ahmadi2, Maral Shams Molavi3

1Department of Clinical Studies, School of Veterinary Medicine, Shiraz University, Shiraz, Iran.
2Department of Pathobiology, School of Veterinary Medicine, Shiraz University, Shiraz, Iran.
3Graduate Student, School of Veterinary Medicine, Shiraz University, Shiraz, Iran.
Email: nikahval@shirazu.ac.ir

**Objectives**- Animal models are used to study different diagnostic or therapeutic protocols. Osteoarthritis (OA) has been induced in different animal species by variety of techniques which fall into two major categories; surgical and chemical ones. All cause pain and discomfort to the animal which is not ethical. Alcohol can cause irreversible neurolysis while damaging non-specifically joint structures. Therefore, it can be used as a pain-free model of osteoarthritis.

**Animals**- 30 rats were divided into two groups (experimental n=20, control n=10).

**Design**- Experimental study

**Procedures**- Pure (99%) ethyl alcohol (0.3 ml) was injected to right knee (stifle joints). As control, injectable saline solution (0.3 ml) was injected to contra-lateral knee joints. On days 3, 7, 14, 28 and 56 animals were sacrificed and histopathological sampling was performed.

**Results**- Histological data revealed that degenerative changes were in progress during the study, becoming more evident and more pronounced at the end of the study. Control specimens showed transient changes. There were no signs of obvious pain or lameness in most of the cases.

**Conclusion and Clinical Relevance**- Present study introduced a pain-free osteoarthritis model in animal.

**Key Words**- Ethyl alcohol, Experimental, Osteoarthritis

**References**


**Poster Presentation**

**The Effect of Platelet Rich Fibrin with Autogenous Omental Graft on Healing of Experimental Achilles Tendon Injury in Rabbits**

Mohammad Barzegar1, Amin Nikpasand2, Hamid Reza Moslemi1,2

1Graduated from Faculty of Veterinary Medicine, Islamic Azad University, Garmser Branch, Garmser, Iran.
2Department of Clinical Sciences, Faculty of Veterinary Medicine, Islamic Azad University, Garmser Branch, Garmser, Iran.
Email: hmoslemi@iau-garmser.ac.ir

**Objectives**- The role of application of platelet rich fibrin (PRF) with autogenous omental graft was evaluated in healing of experimental Achilles tendon injury in rabbits.

**Design**- Controlled laboratory study

**Animals**- Nine adult New Zealand rabbits

**Procedures**- The animals were anesthetized and a partial thickness tenotomy was created on both hindlimbs. In treated group, omental graft secured with PRF. In control group, the graft sutured without PRF.

**Results**- Based on the findings, on the day 15 after injury, the tendon sections showed that healing rate in PRF treated group was higher than that in control group. Furthermore, at days 28 and 45, the results were indicated that there is no difference between PRF treated group and control group.

**Conclusions and Clinical Relevance**- In summary, results of this study have showed that application of BA with autogenous omental graft can improve healing process of damaged Achilles tendon.

**Key Words**- Achill’s tendon, Omentum, PRF

**References**


Evaluation of Fibroblast Like Synoviocytes (FLSs) on Tendon Healing in Rabbits

Mahboobehe Azad-Tirgan1, Farshid Sarrafzadeh-Rezaei1, Hasan Malekinejad2

1Department of Clinical Sciences, Faculty of Veterinary Medicine, Urmia University, Nazloo Road, Urmia, Iran
2Department of Veterinary Pharmacology and Toxicology (VPT), Faculty of Veterinary Medicine, Urmia University, Urmia, Iran.
Email: azad_mhb@yahoo.com

Objective- Hydroxyproline is a specific amino acid of collagen, which is widely used to estimate the collagen content in biological specimens. In the present study, the effects synovium-derived fibroblasts (FLSs) cells and chitosan conduit were evaluated on healing deep digital flexor tendon (DDFT) in rabbits.

Design- Experimental in vivo study

Animals- Sixteen healthy female rabbits

Procedures- The injury model was completed by unilateral tenotomy through DDFT. Immediately after suture repair, the animals were divided into 4 groups. Either FLSs or placebo was intratendinously injected at tendon stumps in groups A (treatment) and B (control), respectively. Groups Cand D were similar to group A and B, in addition that DDFTs was wrapped with chitosan conduit. Immobilization with the cast was continued for two weeks after surgery. Animals were sacrificed at eight weeks after surgery and tendon samples were prepared for measurement of hydroxyproline content.

Results- Hydroxyproline content assessment showed there was a significant difference (P < 0.05) between groups 8 weeks after surgery. Peritendinous adhesions were diminished in chitosan conduit using groups.

Conclusion and Clinical Relevance- There was a significant difference (P < 0.05) between two weeks after surgery. Animals were sacrificed at eight weeks after surgery and tendon samples were prepared for measurement of hydroxyproline content.

References

Influence of Xenogenous-based Bovine-derived Platelet Gel Embedded within a Three-dimensional Collagen Implant on the Healing and Regeneration of the Achilles Tendon Defect

Abdolhamid Meimandi Parizi1, Ahmad Oryan2, Ali Moshiri3

1,3Department of Clinical Sciences, School of Veterinary Medicine, Shiraz University, Shiraz, Iran.
2Department of Pathology, School of Veterinary Medicine, Shiraz University, Shiraz, Iran.
E-mail: meimandi@shirazu.ac.ir

Objective- It was designed a novel xenogeneic-based bovine platelet, embedded it within a tissue-engineered collagen implant (CI) and applied it in an experimentally induced large tendon defect model in rabbits to test whether bovine platelets could stimulate tendon healing and regeneration in vivo.

Design- Research experimental study

Animals- Sixty white New Zealand rabbits

Procedures- The animals were randomly divided into three groups of control (no implant), treated with CI and treated with collagen-platelet implant. In all the animals, left Achilles tendon was surgically excised and the tendon edges were aligned by appropriate tendon suture. To study the tendon healing and its outcome, the experimental animals were evaluated clinically during the study and then euthanized at 60 DPI and their tendons were evaluated by gross pathologic, histopathologic, scanning electron microscopic, and biochemical methods.

Results- Bovine platelets embedded within CI increased inflammation and the rate of implant absorption and matrix replacement compared with the controls and CI alone. Treatment significantly increased diameter, density, amount, alignment and differentiation of the collagen fibrils and fibers (p < 0.05). Treatment also improved echogenicity and homogeneity of the tendons and reduced peritendinous adhesion, muscle fibrosis and atrophy. Treatment also increased the clinical scores and physical activity related to the injured limb when compared with the controls (p < 0.05).

Conclusion and Clinical Relevance- The bovine platelet gel embedded within the tissue-engineered CI was effective in healing and remodeling of the tendon. This strategy could be a valuable option in the clinical practice.
Objective- Protective effect of liquorice on Intestinal ischemia and reperfusion injury (I/R) injuries was studied to assess the ability to diminish injuries.

Design- Experimental in vivo study

Animals- 21 wistar male rats, weighing 280-300 g

Procedures- The animals were randomly divided into three equal groups. In group control, the animals received normal saline and underwent I/R injury (45 min of ischemia followed by 1 h of reperfusion). In Sham group, the animal received liquorice extract without I/R injury. In treatment group, the animal received liquorice extract and underwent I/R injury. Normal saline and liquorice extract were gavaged for two weeks before operation in the related groups. Ischemia was induced by clamping of abdominal aorta above the cranial mesenteric artery. After the experiments, the Intestine samples were taken and the tissues were processed for histopathologic examination. Intestinal histology was semi-quantitatively assessed.

Results- I/R in control group was resulted in severe mucosal damage, congestion and hemorrhage. Histological scores indicating mucosal injury significantly increased in group control compared to the group sham. The severity of intestinal mucosal injury in treatment group was significantly subsided in comparison with in the group control, but there is still significant differences compared to the sham group.

Conclusion and Clinical Relevance- Based on the results, it can be concluded that the aqueous extract of liquorice root diminished Intestinal I/R injuries considerably.

Key Words- Ischemia and reperfusion injury, Kidney, liquorice, Rat

References

Poster Presentation

The Effect of Platelet-rich Plasma (PRP) on Regeneration of Peripheral Nerve Injury in Rabbit Radial Nerve

Seifiollah Dehghani Nazhvani1, Anise Asaadi2, Fateme Namzi2, Zahra Sadat Saadaty*1

1Department of Veterinary Surgery, School of Veterinary Medicine, Shiraz University, Shiraz, Iran.
2Department of Veterinary Pathology, School of Veterinary Medicine, Shiraz University, Shiraz, Iran.
Email: saadaty.sara@yahoo.com

Objective - The present study examined the effect of platelet-rich plasma on the healing of experimentally induced lesions on radial nerve in the rabbit.

Design- Experimental study

Animals- Twelve adult rabbits of both sexes were used in this study.

Procedures- The animals were anesthetized by Ketamin and Xylazin. The medial side of elbow was prepared, the skin was incised about 4 cm, the radial nerve was exposed and crushed by a mosquito hemostat using three degree lock for crushing. The fascia over the crushed nerve was sutured to form a pocket scaffold and an 18 gage angiocat was installed in the pocket with its end left out of skin suture. Platelet Rich Plasma (PRP) was prepared from sheep blood. In each pocket scaffold about 1ml PRP was injected through the angiocat. The animals were monitored for 35 days. Then they were euthanized.

References

Poster Presentation

Protective effect of Liquorice Root Extract on Experimental Intestinal Ischemia-Reperfusion Injury in Rats

Omid Azari1, Reza Kheirandish2, Amin Paidar Ardakani*3, Parham Razavi Ebrahimi4, Hadi Hassibi5

1Department of Clinical Sciences, Faculty of Veterinary Medicine, Shahid Bahonar University of Kerman, Kerman, Iran.
2Department of Pathobiology, Faculty of Veterinary Medicine, Shahid Bahonar University of Kerman, Kerman, Iran.
3Postgraduate student of veterinary surgery, Faculty of Veterinary Medicine, Shahid Bahonar University of Kerman, Kerman, Iran.
4Graduated Student, Faculty of Veterinary Medicine, Shahid Bahonar University of Kerman, Kerman, Iran.
5Hadi Hassibi, University of Sharif, Iran.
Email: amin_paidar@yahoo.com

Objective- Protective effect of liquorice on Intestinal ischemia and reperfusion injury (I/R) injuries was studied to assess the ability to diminish injuries.

Design- Experimental in vivo study

Animals- 21 wistar male rats, weighing 280-300 g

Procedures- The animals were randomly divided into three equal groups. In group control, the animals received normal saline and underwent I/R injury (45 min of ischemia followed by 1 h of reperfusion). In Sham group, the animal received liquorice extract without I/R injury. In treatment group, the animal received liquorice extract and underwent I/R injury. Normal saline and liquorice extract were gavaged for two weeks before operation in the related groups. Ischemia was induced by clamping of abdominal aorta above the cranial mesenteric artery. After the experiments, the Intestine samples were taken and the tissues were processed for histopathologic examination. Intestinal histology was semi-quantitatively assessed.

Results- I/R in control group was resulted in severe mucosal damage, congestion and hemorrhage. Histological scores indicating mucosal injury significantly increased in group control compared to the group sham. The severity of intestinal mucosal injury in treatment group was significantly subsided in comparison with in the group control, but there is still significant differences compared to the sham group.

Conclusion and Clinical Relevance- Based on the results, it can be concluded that the aqueous extract of liquorice root diminished Intestinal I/R injuries considerably.

Key Words- Bovine platelet, Healing, Regenerative medicine, Tendon
and nerve samples were collected for histopathological evaluation.

**Results-** In the control group there were no myelin sheath or Schwann cells, axons were swollen and the mono nuclear inflammatory cells and large reactive spaces were observed. In the treatment group the situation and the integrity of nerve tissue was better, some myelin sheath was formed and Schwann cells were increased. The inflammatory cells were very low and swollen axons were seen rarely. The large spaces were decreased and small spaces were observed in some areas.

**Conclusion and Clinical Relevance-** The PRP had affected the regeneration of the peripheral nerve damage. It is good for clinical traumatic injury to the nerve fibers.

**Key Words-** Regeneration of peripheral nerve damage, Platelet-rich plasma (PRP), Rabbit

**References**

**Poster Presentation**

**Comparison of Fresh Frozen and Lyophilized Tendon Xenograft Transplantation from Horse to Rabbit: A Preliminary Study**

**Aida Hassanpour*1, Seifollah Dehghani Nazhvani1, Fateme Namazi2**

1 Department of Surgery, School of Veterinary Medicine, Shiraz University, Shiraz, Iran.
2 Department of Pathology, School of Veterinary Medicine, Shiraz University, Shiraz, Iran.
Email: Aida.hassanpour@yahoo.com

**Objectives-** The purpose of this study was the compare fresh and lyophilized tendon xenograft transplantation using horse’s flexor tendon to rabbit flexore tendon.

**Design-** Experimental surgery

**Animals-** Adult rabbits of both sexes

**Procedures-** An Arabian horse was euthanized due to uncurable condition. Under aseptic conditions the tendons of both front and hind legs were dissected. Half of tendons were lyophilized under vacuum condition and -80 degree centigrade for 48 hours. The rest of the tendons were kept in the ordinary house freezer (-10°C). The rabbits were anesthetised. The deep digital flexor tendon of right leg was, isolated and a piece of 3cm tendon was removed. In Group1 a piece of frozen horse tendon was sutured in place of the rabbit tendon by locking loop pattern. In Group2 a piece of lyophilized tendon was sutured in the rabbits tendon. After 60 days, rabbits were euthanized and Samples of tendon graft tendon unit were collected for histomorphological study.

**Result-** In the second group all grafts were rejected. In the first group, 3 of 5 grafts were confirmed. Dense and regular connective tissue and collagen fibers were seen in H & E and Masson trichrome staining.

**Conclusion and Clinical Relevance-** It is better to use the fresh tendon in traumas, if xenograft transplantation is necessary.

**Key Words-** Xenograft, Fresh frozen horse tendon, Lyophilized tendon

**References**

**Poster Presentation**

**Inactive Platelet Rich Plasma (PRP) Improve Early Tendon Healing in a Rabbit DDF Tendon Model**

**Sarah Javanmardi*1, Raziallah Jafari Jozani1, Javad Ashrafi Helan2, Amirata Vosough3, Neda Hosseinzadeh3**

1 Departments of Clinical Sciences, Faculty of Veterinary Medicine, Tabriz University, Tabriz, Iran.
2 Departments of Pathobiology, Faculty of Veterinary Medicine, Tabriz University, Tabriz, Iran.
3 Undergraduate Student, Faculty of Veterinary Medicine, Tabriz University, Tabriz, Iran.
Email: S.javanmardi@tabrizu.ac.ir

**Objectives-** PRP contains growth factors that influence the wound healing. The activation of PRP before application creates a gel which would be ideal for cell-seeded scaffolds; however, it is impossible to deliver this gel without a scaffold via a small gauge needle because of its high viscosity. Moreover, the activation of PRP before application in a musculoskeletal tissue may not be needed. The aim of this study was to investigate the effects of inactive PRP on the early stages of tendon healing.

**Design-** Experimental study

**Animals-** Ten New Zealand white rabbits weighing 2.2-2.5 kg.

**Procedures-** PRP samples were prepared using a twice centrifugation method of modification of the Curasan
techniques. The concentration of platelet of PRP was 4.08 times of whole blood. The DDF tendon of rabbits was transected to make rupture models. After primary repair, experimental group (n=5), was received PRP (0.5ml) at repair site. No treatment was given to control group (n=5). At 3 week after operation, the tendons of each group were harvested for histopathological evaluation. (H&E and masson's trichrome staining)

Results: The histopathological (H&E) observation showed significant differences in Percentage of fibrillar linearity, number of capillaries in neotendon, number of capillaries in epitenon and epitenon thickness in treatment group compared to the control group (P<0.05). Results from Masson's trichrome were confirmed that H&E staining.

Conclusion and Clinical Relevance: Intradtenous application of inactive PRP can significantly improve the histological parameters in the early stage of tendon healing. The findings of the present study have clinical importance as the early time-period during tendon healing is crucial in the treatment of tendon injuries.

Key Words- PRP, Tendon, Rabbit

References

Poster Presentation

Effect of Topical Nitroglycerine on Excisional Wound Healing on Rabbit Model

Sorosh Mohit Mafi1, Hesam Savadkoohi*2, S. Amir Kamali3

1Department of Clinical Science, Faculty of Veterinary Medicine, Karaj Branch of Islamic Azad University, Karaj, Iran. 2Department of Clinical Science, Faculty of Veterinary Medicine, Shiraz University, Shiraz, Iran. 3Department of Pathobiology, Faculty of Veterinary Medicine, Shiraz University, Shiraz, Iran. Email: hsavadkoohi@yahoo.com

Objective- Nitroglycerin is a vasodilator agent. Coagulating factors and immune cells are important in initial phases of wound healing, whereas oxygen and nutrients play a significant role in ending phases. Considering the important of tissue blood supply in these factors, nitroglycerin could be a proper treatment for wound healing. The aim of this study was to investigate the effect of nitroglycerin on wound healing.

Design- Experimental study

Animals- An experimental study was designed on six New Zealand white rabbits.

Procedures- Two incisional square shaped wounds were created in the back region of each rabbit on an equal distance from thoracic vertebrae and wound healing was studied during a 28-day trail. The right wounds were considered as treatment wound and the left wounds from day 1 to 7 and Vaseline was administered on same days to control wounds. The process of wound measurement was done using cross et al. methods on days 3, 5, 7, 15, 21, 28. All data's was evaluated by use of T-test for paired data, with significance at P<0.05.

Results- There was no significant difference in wound area between two groups among the 28-day period. Therefore Nitroglycerin could not affect significantly on wound healing. On the basis of similar situation for all animals, exogenous factors, bacteria and tissue perfusion could be the most influential factors on healing process in first three days. Results did not declare the importance of blood supply in this first period. But the effect of nitroglycerin was noticeable during day 21 to 28. This could be the result of nitroglycerin vasodilative effect that influences the epithelialization.

Conclusion and Clinical Relevance- Although nitroglycerin could be effective in some phases of wound healing, it seems this agent could not affect healing process significantly. For achieving the beneficial outcome, co-administration of nitroglycerin with other drugs which influence wound healing is recommended

Key Words- Nitroglycerin, Wound healing, Vasodilatation

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Poster Presentation

Protective Effects of Vitamin C & E and Hydrocortisone against Intestinal Ischemia-Reperfusion Injury in Rats

Omid Azari1, Reza Kheirandish1, Parham Razavi Ebrahimii2, Mohammad Faraji Abbasi3, Masoud Bidi3, Mohammad-Reza Esmaili-Nejad2

1Department of Clinical Sciences, Faculty of Veterinary Medicine, Shahid Bahonar University, Kerman, Iran.
Objective- This study was performed to investigate the protective effects of different medications (vitamin C, vitamin E and Hydrocortisone) against experimental intestinal ischemia-reperfusion injury.

Design- Original Study

Animals- 25 male Wistar albino rats

Procedures- In this study rats randomly divided into five equal groups. Group Normal: Intact group, Group Control: Ischemia-reperfusion group (45 min of ischemia followed by 1 h of reperfusion), Group Vitamin C: Ischemia-reperfusion plus vitamin C treatment (50 mg/kg, IV, immediately after reperfusion), Group Vitamin E: Ischemia-reperfusion plus vitamin E treatment (10 mg/kg, IM, 15 minutes before reperfusion), and Group Hydrocortisone: Ischemia-reperfusion plus hydrocortisone treatment (50 mg/kg, IV, immediately after reperfusion). Ischemia was induced by clamping of abdominal aorta above the cranial mesenteric artery. After the experiments, the jejunum was removed and the tissues were processed for histopathologic examination. Intestinal histology was semi-quantitatively assessed.

Results- Control group animals showed severe mucosal damage. Intestinal mucosa in the Vitamin C and E groups were noticeably preserved in comparison with Control group (p<0.05). Comparison of histologic scores between the treatment groups showed that the Vitamin C and E groups have significant improvement compared to the Hydrocortisone group (p<0.05), but there is no significant difference between the Vitamin C & E groups (p>0.05). The Hydrocortisone group doesn’t show any improvement in histopathologic scores in the comparison with control group (p>0.05). There are significant differences between normal and all treatment groups (p<0.05).

Conclusion and Clinical Relevance- Based on the results, it can be concluded that administration of Vitamin C and E before reperfusion of blood flow to the ischemic tissue diminish deleterious effects of IR injuries in intestine.

Key Words- Intestine, Ischemia-reperfusion, Vitamin C, Vitamin E, Hydrocortisone

References

Poster Presentation

Study on the Effect of Ground Black Cumin (Nigella sativa Linn.) on Experimental Renal Ischemia-reperfusion Injury in Rats

Ghafour Mousavi1, Daryoush Mohajeri2

1Department of Clinical Sciences, College of Veterinary Medicine, Tabriz Branch, Islamic Azad University, Tabriz, Iran.
2Department of Pathobiology, College of Veterinary Medicine, Tabriz Branch, Islamic Azad University, Tabriz, Iran.
Email: gh_mousavi@iaut.ac.ir

Objective- To evaluate the effect of Black cumin (Nigella sativa Linn.) pre-treatment on renal ischemia/reperfusion (I/R) induced injury in the rats.

Design- This research is an experimental study.

Animals- A total of 40 male Wistar rats were randomly allocated into 5 equal groups including Sham, I/R model and three I/R+ Black cumin (5, 10 and 20%)-treated groups.

Procedures- I/R groups’ kidneys were subjected to 60 min of global ischemia at 37 °C followed by 24 h of reperfusion. At the end of reperfusion period, the rats were euthanized. Superoxide dismutase, catalase and glutathione peroxidase activities as well as reduced glutathione and renal malondialdehyde contents were determined in renal tissues. Kidney function tests and histopathological examination were also performed.

Results- High serum creatinine, blood urea nitrogen and uric acid as well as malondialdehyde (MDA) levels, and low antioxidant enzyme activities were observed in I/R rats compared to the sham rats. Pre-treatment with Black cumin for three weeks prior to IR operation improved renal function and reduced I/R induced renal inflammation and oxidative injury. These biochemical observations were supported by histopathological test of liver sections.

Conclusion and Clinical Relevance- The results of this study showed that Black cumin significantly prevented renal I/R-induced functional and histological injuries.

Key Words- Black cumin (Nigella sativa Linn.), Ischemia-reperfusion, Kidney, Rats

References
Posterior Presentation

Protective Strategies against Renal Ischemia-reperfusion Injury Using Different Antioxidative Agents

Omid Azari1, Reza Kheirandish2, Mohammad Faraji Abbasi2, Amin Paidar2, Shahin Gahremani Ghareh Cheshmeh2, Hemad Shafiei2

1Department of Clinical Science, Faculty of Veterinary Medicine, Shahid Bahonar University of Kerman, Iran.
2Department of Pathobiology, Faculty of Veterinary Medicine, Shahid Bahonar University of Kerman, Iran.
3Postgraduate of Veterinary Surgery Student, Faculty of Veterinary Medicine, Shahid Bahonar University of Kerman, Iran.
4Undergraduate of Veterinary Medicine Student, Faculty of Veterinary Medicine, Shahid Bahonar University of Kerman, Iran.
Email: mohammad.f.abbasi@gmail.com

Objective- This study was performed to investigate the protective effects of different antioxidants such as vitamin C, vitamin E, hydrocortisone and combination of these agents against experimental renal ischemia-reperfusion injury.

Design- Group Sham: Intact group, Group I/R: Ischemia-reperfusion group (45 min of ischemia followed by 1 h of reperfusion), Group Vit C: Ischemia-reperfusion plus Vit C treatment (50 mg/kg, IV, immediately after reperfusion), Group Vit E: Ischemia-reperfusion plus Vit E treatment (10 mg/kg, IM, 15 minutes before reperfusion), Group Hydrocortisone: Ischemia-reperfusion plus hydrocortisone treatment (50 mg/kg, IV, immediately after reperfusion), and Group Combination: Ischemia-reperfusion plus combination of Vit C, E and hydrocortisone treatment (at the mentioned method).

Animals- This study 30 male Wistar albino rats randomly divided into six equal groups.

Procedures- Ischemia was induced by clamping of abdominal aorta above the renal artery. After the experiments, the left kidney was removed and the tissues were processed for histopathologic examination. Renal histology was semi-quantitatively assessed.

Results- Severe injuries such as necrosis of tubules, atrophy of glomerulus, congestion and hemorrhage was observed in group I/R. Histological scores indicating tissue injury significantly decreased in all treatments group compared to the IR group. The renal tissue in group treatment was preserved in comparison with that in the group IR. Comparison of histologic scores between the treatment groups showed that group combination was more effective and group Vit E was less effective in protecting of renal tissue against IR injuries.

Conclusion and Clinical Relevance- Based on the results, it can be concluded that simultaneous administration of combination of Vit C, E and hydrocortisone before reperfusion of blood flow to the ischemic tissue could show a synergy against deleterious effects of IR injuries in kidney.

Key Words- Kidney, Ischemia, Reperfusion, Vit C, Vit E, Hydrocortisone, Combination therapy, Rat

References

Poster Presentation

A Comparison between Different Nerve Conduits in Rats: Sciatic Nerve Growth within Dermis, Venous and Nerve

Mir Sepehr Pedram1, Saeed Farzad Mohajeri1, Setareh Ghasemi1, Mohammad Javad Fatemi2, Kamal Seyed Foroutan3, Abass Kazemi Ashlani2, Maryam Jafari Mansoori2, Reza Vaghardoost4, Aidin Hosseinpolli2, Fatemeh Rajabi2, Seyed Jabar Mousavi2

1Department of Surgery and Radiology, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran.
2Department of Plastic and Reconstructive Surgery, Burn Research Center, Hazrat Fatemeh Hospital, Tehran University of Medical Sciences, Tehran, Iran.
3Department of Plastic and Reconstructive Surgery, Qom University of Medical Sciences, Qom, Iran.
4Department of Plastic and Reconstructive Surgery, Ghazvin University of Medical Sciences, Ghazvin, Iran.
Email: saeedfarzad@ut.ac.ir

Objective- Rehabilitation of peripheral nerves after injuries with sufficient functional recovery is a significant consideration in reconstructive surgery. The objective of
present study is examination of the efficacy of dermal conduit, for the first time, in bridging a gap of 10 mm by assessing the morphometric parameters of sciatic nerves in rats in comparison with two other more routine methods.

**Design-** Experimental study

**Animals-** Sixty healthy male Wistar rats

**Procedures-** A 10 mm gap was created in right sciatic nerve of all rats. Rats divided into three groups. In group A the autogenous nerve grafts were used to reconstruct the gaps. In group B vein conduit were used to graft the nerves and in group C dermal tube were used to bridge the defects. Morphologic studies were carried out after 3 month.

**Results-** regeneration pattern and the density of nerve fibers were significantly better and higher in autogenous nerve graft group. The efficacy of nerve growth into the dermal tube group was significantly poor in comparison to other two groups.

**Conclusion and Clinical Relevance-** This study indicates that the dermal tube is not a suitable conduit for nerve regeneration and its regeneration efficiency is significantly lower than autogenous nerve graft and vein tube.

**Key Words-** Nerve injury, Nerve conduit, Dermal tube, Rat

**References**


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**Poster Presentation**

**Advancement in Bone Graft and Graft Substitute for Delayed Union and Nonunion Fractures Treatment: A Review**

**Emad Sayahi**1,2, Abdolhamid Meimandi parizi1

1Professor of Veterinary Surgery, Department of Surgery, School of Veterinary Medicine, Shiraz University, Shiraz, Iran.
2Resident of Veterinary Surgery, Department of Surgery, School of Veterinary Medicine, Shiraz University, Shiraz, Iran.

Email: emad.sayahi@yahoo.com

Bone is the most common transplant tissue after blood. Bone grafting has advanced enormously since pieces of a dog’s skull used to repair a soldier’s cranium in 17th century. Bone transplantation induces osteogenesis to repair bone defects. Despite being the most efficient, autogenous bone requires another surgery and its time consuming that increase trauma and infection risks. Allogeneic bone grafts can be an alternative, however the risk of microbiological contamination, transmission of germs, delayed incorporation, and immune reactions still remains. Synthetic graft substitutes combine scaffolding properties with biological elements to stimulate cell proliferation and differentiation and eventually osteogenesis. However, synthetic grafts generally lack osteoinductive or osteogenic properties and have various effects on bone healing. Current advances aims to make a scaffold that combines the unique osteogenic characteristics of ceramic bio composite materials to make the best physiologic conditions. The main principle of bone tissue engineering strategy is to use an osteoconductive porous scaffold in combination with osteoinductive molecules or osteogenic cells. This scaffold must provide: 1) A three-dimensional platform allowing for osteogenic cellular attachment and growth and vascular formation, 2) Structural integrity while the damaged tissue heals, and 3) Non-toxic integration, degradation or resorption into the host over an appropriate time. The combination of inorganic, ceramic materials with cells, polymers and growth factors has come very close to creating a bone graft capable of meeting each of these requirements. Many new technologies have been introduced that are so promising in their ability to heal small bone fractures and induce new bone formation, include porous calcium phosphate pastes and hydroxyapatite cements. However, there is still a lack of quality and proven materials for load bearing purposes, for example porous interconnected hydroxyapatite (HA) and HA/tricalcium phosphate (TCP) (60/40) ceramics probably are very potent materials for hard tissue repair. A study on their mechanical behavior underweight bearing conditions revealed an increase in mechanical stability during the early critical time where implant and/or bone–implant interface failures occur frequently. We present this review on bone grafts and graft substitutes in clinical use, focusing especially on new techniques and the recent advancement in treatment delayed union and non-union in orthopedic fracture repair to reminder of how much there is still remain to improve treatment of these fractures for clinical practice.

**Key Words-** Nonunion, Delay union, Bone graft substitute

**References**

The Influence of Enoxaparin and Clopidogrel on Survival of Accidental Skin Flap in Rat Animal Model

Mir Sepehr Pedram1, Atieh Kheirollahi*1, Iman Asheghian1, Mohammad Javad Fatemi2, Kamal S Forootan2, Seyed Ziaaddin S Jalali1, Seyed Jaber Mousavi2, Saeed Farzad1, Zahra Safarian1

1Department of Surgery and Radiology, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran.
2Burn Research Center, Hazrate Fatemeh Hospital, Tehran University of Medical Sciences, Tehran, Iran.
3Vali Asr Police Hospital, Tehran, Iran.

Email: kheirollahi@ut.ac.ir

Objective- Random pattern skin flaps are common in various fields of plastic and reconstructive surgery and necrosis is its important possible complication. In this attention we execute a study to the efficacy of low-molecular weight heparin, clopidogrel and their combination to improve the flap survival.

Design- Animal experimental study

Animals- Forty male adult Sprague-Dawlay rats

Procedures- Rats were divided accidentally into 4 groups. Standard oblong, distally based dorsal random pattern skin flap was elevated. To prevent the graft effect, a sterile sheet was put under the flap. No pharmacological agent was prescribed for the control group. In group 2, single dose of enoxaparin (3.2 mg/kg) was immediately prescribed subcutaneously after surgery. In group 3, clopidogrel (25 mg/kg) was given orally for 7 days. In control group, enoxaparin was daily and near the skin for 210 seconds. After 45 days all rats were euthanized. The samples were stained by H&E and histopathology evaluations were performed.

Results- Clopidogrel was the only pharmaceutical agent that produced a significant increase in the flap survival area (P<0.05).

Conclusion and Clinical Relevance- Clopidogrel may be an impressive pharmaceutical agent that significantly increases viability of accidental skin flaps in rats, but low-molecular weight heparin and their combination did not have any considerable advantageous effects.

Key Words- Enoxaparin, Clopidogrel, Random Skin flap, Rat

References

Poster Presentation

Evaluation of Low-Level Laser Therapy on Experimental Bone Defect Healing in Rat

Fardin Bodaghi*1, Ghafour Mousavi2, Daryoush Mohajeri3

1Student of Veterinary Medicine, College of Veterinary Medicine, Tabriz Branch, Islamic Azad University, Tabriz, Iran.
2Department of Clinical Sciences, College of Veterinary Medicine, Tabriz Branch, Islamic Azad University, Tabriz, Iran.
3Department of Pathobiology, College of Veterinary Medicine, Tabriz Branch, Islamic Azad University, Tabriz, Iran.
Email: fardinvet@yahoo.com

Objective -The objective of this study was to histologically evaluate the efficacy of the low-level laser therapy on bone defect healing in the rats.

Design- This research is an experimental study.

Animals- A total of 20 male SD rats were randomly allocated to 2 equal groups including control and experiment groups.

Procedures- After induction of general anesthesia, a hole in size of 2×3 mm in diameter and depth was made using a dental bit in the inner aspect of the between condyles of left femur. In control group defect was left untreated. The experimental group was treated with laser irradiation. For this purpose, Mustang-2000 was used. Laser with a wave length of 632.8 nm radiation. The program of radiation was daily and near the skin for 210 seconds. After 45 days all rats were euthanized. The samples were stained by H&E and histopathology evaluations were performed.

Results- In control group, defect seemed to be filled with adipous tissue and in spite of a moderate osteogenic activity and some osteoblasts could already be seen specially was detectable attached to the edge of defects. In experiment group, many osteoblasts groupings, and young bone trabeculas increased in number and bone trabeculas more organized. Bone trabeculas with regulated osteoblast cells and highly osteogenic activity already are seen. In terms of osteoid formation, statistically significant differences were observed between experimental and control groups at 45th day (p<0.05).

Key Words- Low-level laser therapy, Bone healing, Rat
Conclusion and Clinical Relevance- This study has shown that low-level laser therapy stimulated bone formation in defect area of bone in rat.

Key Words- Low-level laser therapy, Histopathology, Bone, Healing, Rats

References

Poster Presentation

Standardization of the Second and Third Degree Burn’s Wound by Using Rabbit and an Animal Model

Mir Sepehr Pedram1, Farajollah Adibhashemi2, Navid Moeinoroaya3, Amirali Shahbazifar4

1Department of Surgery and Radiology Faculty Veterinary Medicine University of Tehran, Tehran, Iran.
2Department of Surgery and Radiology Faculty Veterinary Medicine University of Tehran, Tehran, Iran.
3Graduated from Faculty of Veterinary Medicine Islamic Azad University,Garmsar Branch, Garmsar, Iran.
4Department of Pathobiology Faculty Veterinary Medicine University of Tebriz, Tabriz, Iran.
Email:navid.moein7@yahoo.com

Objective- Burn injury is a frightening & potentially life-threatening event for patients and families. Because of this loss/change in their lives, they can often face many difficult emotions at varying with degrees after the injury. To find the best way to treat burn’s wounds can help patients to reduce costs and decrease pain. Experimental burn models are always needed, an essential bench for burn research.

Design- Longitudinal and observational experimental study

Animals- Ten adult male rabbit weigh between 750 to 800 gr.

Procedures- The burn wound were randomly divided into 6 groups. Thermal lesions were produced in 10 males, positioning a massive aluminum bar (2*3 cm, Group 1: 95 ° C for 10 sec, group 2: 95 ° C for 15 sec, group 3: 95 ° C for 20 sec, group 4: 100 ° C for 10 sec, experimental model for third degree burns in rabbit: group 3: 95 ° C for 20 sec, group 5: 100 ° C for 15 sec.

Conclusion and Clinical Relevance- The new burn model describe a simple and reproducible animal burn model for measuring burn depth that they believe will facilitate standardization and comparison within future burn studies and increase our knowledge in the field of wound healing, thereby supporting the science and practice of wound repair worldwide.

Key Words- Burn depth, Thermal injury, Pathology, Scale, Animal model

References
**Animals**- 51 white female rats

**Procedures**- In this study, 51 white female rats which were the same in race and weight were used. First, the rats were divided into 2 groups. The first group included 39 rats undergone ovariectomy operation and the other group included 12 rats formed our sham operation group. After 6 mounts of surgery, 3 rats of each group were taken and their maxilla bone was cut out for evaluation of formation of the osteoporosis. Titanium screws which were 1mm in diameter and 7mm in length were put in the maxillary bone of the other rats. Then, the rats of osteoporotic group were divided into subgroups. The first group was rats received no therapies. The second group received 30 mg/kg/day estrogen P.O the third group were rats which were treated with vitamin D3 (0.02 microgram/kg/day) P.O and the forth were that rats which received Alendronate (1 mg/kg/day) P.O the treatment began from the placement of titanium screws and continued for 2 mounts. Then all the rats of 5 groups were sacrificed. The bone specimens carrying implants cut out for histopathologic examinations and put in the 10% buffered formalin solution. After that, specimens decalcified with 10% formic acid, titanium screws were taken out and sectioned in the long axis of screws to the thickness of 3 micrometer. In order to light microscopic examinations the sections were prepared by H & E staining. Because of lack of cases, statistical analysis was not used and analysis of the data was done.

**Results**- Our study showed that therapies with alendronate and VitD can increase incremental lines of bone, but there was no evidence of such an effect in the cases which were treated by estrogen. Formation of inflammation sequestra and presence necrotic materials and debrises were not related to replacement therapies. The surrounding epithelium of titanium screws was ortho kratinized and akantotic squamous stratified epithelium. The inflammation with lymphocytic inflammatory cells and less plasmacells.

**Conclusion and Clinical Relevance**- Evidence of such an effect in the cases which were treated by estrogen. Formation of inflammation sequestra and presence necrotic materials and debrises were not related to replacement therapies. The surrounding epithelium of titanium screws was ortho kratinized and akantotic squamous stratified epithelium. The inflammation with lymphocytic inflammatory cells and less plasmacells.

**Key Words**- Dental implant, Osteoporosis, Osteointergration , Dog protease

**References**


**Original Study**

**The Evaluation of the Healing Potential of Cuscutaeyphtyumunessential Oil and Water Soluble Extract on Experimental Skin Wounds**

Mohammad Mehdi Oloumi1, Amin Derakhshanfar2, Hadi Hassibi*3

1Department of Clinical Science, School of Veterinary Medicine, Shahid Bahonar University of Kerman, Kerman, Iran.
2Department of Pathobiology, Faculty of Shiraz Medical University, Shiraz, Iran.
3Postgraduate Student of Veterinary Surgery, Faculty of Veterinary Medicine, Shahid Bahonar University of Kerman, Kerman, Iran.

E-mail: Hassib64@gmail.com

**Objective**- To evaluate the healing potential of *Cuscutaeyphtyum* essential oil and water soluble extract on experimental skin wounds.

**Design**- Original Study

**Animals**- 24 males Spragne-Dawly rats

**Procedures**- Animals were randomly assigned in 4 equal groups. Under general anesthesia, a skin defect was made by 10 mm skin punch on the back of the animals. Then, water soluble extract and essential oil (treatment groups), glycerine and normal saline (Control groups) were applied on the wounds in each group, respectively, for 7 days. The animals were sacrificed on day 8 and histopathological samples were taken. Wound planimetry was also performed. Besides, the antibacterial activity of the extracts was evaluated.

**Results**- Macroscopically, the surface area of the treatment groups were less than the control wounds, significantly. Microscopically, the re-epithelialization was greater in treatment wounds in comparison with the control wounds. However, re-epithelialization was incomplete. The formation of the granulation tissue was much greater in treatment groups than the control groups. Antibacterial activity was absent.

**Conclusion and Clinical Relevance**- This study showed that *C.epythymun* extracts promote skin wound healing mainly by increasing the formation of granulation tissue
also. The extracts have not capability in inhibiting the bacterial growth.

Key Words- *Cuscutaepythymum*, Wound healing, Skin, Rat

References

Poster Presentation

Protective Effects of Mummy Remedy on Cutaneous Burn Wound Healing

Omid Azari1, Reza Kheirandish1, Hamzeh Soltaninezhad1, Naghme Ghasemkhani2, Amin Paidar Ardakani2

1Department of Clinical Sciences, Faculty of Veterinary Medicine, Shahid Bahonar University of Kerman, Kerman, Iran.
2Department of Pathobiology, Faculty of Veterinary Medicine, Shahid Bahonar University of Kerman, Kerman, Iran.
3Postgraduate Student of Veterinary Surgery, Faculty of Veterinary Medicine, Shiraz University, Shiraz, Iran.
4Graduated Student, Faculty of Veterinary Medicine, Shahid Bahonar University of Kerman, Kerman, Iran.
5Postgraduate Student of Veterinary Surgery, Faculty of Veterinary Medicine, Shahid Bahonar University of Kerman, Kerman, Iran.

Email: hamzeh.soltani.vet@gmail.com

Objective- Mummy is a natural remedy that is used traditionally in treatment of various kinds of disorders.

Design- Experimental in vivo study

Animal- Four mature male new zeland white rabbits

Procedures- After induction of anesthesia, the animals restrained in sterna recumbency and standard surgical preparation on dorsal surface of chest was performed. Then a cotton band (1×1 cm) was dipped insulfuric acid 50% and placed on the skin of either side of the spinefor 5 min. Right wounds were considered as a control group and left wounds as a treatment group. The right wounds were lavaged with normal saline and the left ones were lavaged with sterile solution of mummy, once a day.

14 and 28 days after creation of cutaneous burn wound, a full-thickness skin samples were taken from wound edge. The samples were stained using hematoxilline-eosine (H&E) routine method and prepared for histopathologic evaluations between control and treatment groups.

Results- At day 14, in control group necrosis and severe wound inflammation with minimal re-epithelization and granulation tissue formation was observed, but in treatment group, degree of necrosis and inflammation substantially was reduced and process of re-epithelization and granulation tissue formation was more obvious.

At day 28, wound bed remarkably was filled with healthy granulation tissue and new epithelaliization covered the wound surface, in treatment group. While, in control group, despite of new epithelialization and granulation tissue formation, inflammatory reaction with presence of neutrophils was observed in the wound.

Conclusion and Clinical Relevance- Results of this study showed that mummy remedy considerably causes acceleration of cutaneous burn wounds healing.

Key Words- Mummy, Cutaneous burn wound, Rabbit

References