AB08. Stem cell therapy in urology

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Abstract: Stem cells (SCs) are classified into embryonic and adult types; the latter is further divided into several subtypes including mesenchymal stem cells (MSCs), which are the most extensively studied adult SCs in the field of regenerative medicine. In urology the most frequently used MSCs are derived from the bone marrow, skeletal muscle, and adipose tissue. Due to its abundant tissue source and ease of isolation, adipose tissue-derived MSC (ADSC) is gaining wider acceptance as the most promising therapeutic cell type.

Regardless of their tissue origin, MSCs have been shown to locate near or within blood vessels. In adipose tissue we demonstrated their localization in the capillaries and in the adventitia of larger blood vessels, and this has been independently confirmed by all subsequent studies. Thus, in a recent review article we proposed that MSCs are vascular stem cells, and this helps explain why MSCs exist in not only the bone marrow but also other adult tissues.

Although MSCs have been shown to possess multi-lineage differentiation potential, the evidence is mostly in vitro. In a recent review article we discussed in detail why current in vivo evidence is unconvincing. Furthermore, in a recent book chapter we discussed that, instead of cellular differentiation, paracrine action is the principal mechanism through which MSCs exert therapeutic effects.

MSC therapy for the kidney has been demonstrated in both acute and chronic renal failure animal models. The mechanism is generally trophic and anti-inflammatory while cell differentiation or engraftment is rarely detected. In 3 recent clinical trials MSC administration has been shown to improve kidney transplantation. For the ureter, both BMSC and ADSC have been tested for the construction of tissue grafts. For the bladder, MSCs have been investigated for the construction of tissue grafts and for the treatment of bladder dysfunction. In regard to the urethra, which is the most extensively investigated urological tissue in terms of SC therapy, we have recently summarized and discussed all published studies on SC therapy for stress urinary incontinence. In regard to the penis, which is the second most investigated urological organ in terms of SC therapy, we have also recently summarized and discussed all published studies on SC therapy for erectile dysfunction. Papers that are published more recently will be updated in this talk.

Keywords: Stem cell therapy; urology; adipose tissue-derived MSC (ADSC)

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AB09. Future ED therapy: Endogenous stem cells

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Introduction: Activation of endogenous somatic stem cells (SSCs) might help conservation intrinsic healing capacity of a healthy organism as well as rejuvenation of damaged erectile function.

Aim: The aim of this study is to investigate the feasibility and mechanism of incarisideII (ICAII) in the treatment of ED in a rat model of bilateral cavernous nerves (CN) injury.

Methods: Sixty newborn male rats were intraperitoneally injected with 5-ethynyl-2-deoxyuridine (EdU; 50 mg/kg) for the purpose of tracking endogenous SSCs. Eight weeks later, forty-eight rats underwent CN crush injury and were randomized into gavage feeding of solvent (vehicle group), ICAII 0.5, ICAII 1.5 or ICAII 4.5 mg/kg/day. Twelve animals underwent sham surgery, received vehicle treatment and served as sham group. Treatment was continued for 4 weeks followed by a wash-out period of 72 h.

Main outcome measures: Intracavernous pressure (ICP). Immunofluorescence of neuropathology, smooth muscle cells (MSCs) atrophy and endogenous SSCs differentiation. Western blot of neuronal nitric oxide synthase (nNOS), α-SMA, and signaling pathway proteins.
**Results:** Daily gavage feeding of ICAII resulted in a significant improvement of erectile function compared to vehicle group. ICAII treatment partially prevented distortion of normal nerve anatomy, SMC loss and collagen deposition in the penis. More label retaining cells (LRCs) differentiated into Schwann cells and MSCs in ICAII treated rats than in vehicle controls. In addition, the trend of p38 mitogen activated protein kinase (MAPK) activity between groups was similar as that of EdU-positive cells. All these changes were caused by ICAII in a dose-dependent manner.

**Keywords:** Endogenous stem cells; ED; Intracavernous pressure (ICP); ICAII

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**AB10. Laparoscopic radical anatomy of prostatectomy**

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**Abstract:** In recent years, laparoscopic radical prostatectomy (LRP) has been established as a safe and effective treatment for localized prostate cancer. With better visualization of the anatomy, LRP has the potential to provide a gold standardization for prostate cancer. However, outcomes include urinary incontinence, bleeding and sexual dysfunction, which can have significant adverse effects on quality of life, remains a huge challenge. Here, we have performed laparoscopic radical anatomy of prostatectomy for localized prostate cancer, and obtained satisfactory results. Experience including: We are familiar with the local anatomy of prostate in preoperative, and carefully identify important anatomic symbols, such as bilateral fascia reflexed, the junction of bladder and prostate in introoperative; We identify correct anatomy of prostate to avoid blind clamp, burning, and properly handle the fascia reflected, penile deep dorsal neurovascular complex and prostate lateral ligament to avoid blood loss; We are carefully isolate the junction of bladder neck and prostate, which is an important part of controlling urination; Fully open Dirichlet fascia when we isolate the dorsal prostate, and along the anterior rectum gap close to the prostate to separate the apex of prostate; It is as much as possible to retain the urethral length when the separation of the apex of the prostate, and cut off urethra close to the apex of the prostate with scissors; Then a careful dissection of the prostate laterally from its periprostatic fascia was performed with preservation of the nerves and vessels contained in the fascias, we open Dirichlet fascia along the seminal vesicle basal, close to the prostatic fascia isolate prostate dorsal until the apex of the prostate called as interfascial technique, and cut off the endopelvic fascia only ventrally and medially to the puboprostatic ligaments were spared called as intrafascial technique; Single needle suture plus V-Loc one-way barbs suture in the urethra 5, 7, 10, 12, 2 point continuous suture to relieve the tension, shorten the operation time, and reduce the occurrence of leakage of urine.

**Keywords:** Laparoscopic radical prostatectomy (LRP); prostate cancer; anatomy

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**AB11. New technology of 3D imaging/reconstruction for robotic renal surgery**

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**Abstract:** Robotic surgery features the minimal invasiveness, correct identification of surgical layers, and acceleration of surgical education, which constitutes the