Huan-Ka Chiung 蔣奐巧
(Y17)

The impact of pre-operative Maximum Urethral Closure Pressure (MUCP) on Mid-urethral sling (MUS) outcomes

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Objective: to assess the surgical outcomes of patients with pure urodynamic stress incontinence (USI) following one of the 3 generations synthetic mid-urethral slings (MUS) in differing range group of pre-operative maximum urethral closure pressure (MUCP). Secondary objective is to delineate the risk factors associated with MUS failure in pre-operative MUCP groups with inferior outcomes.

Materials and Methods: A total of 688 patients records who underwent MUS procedure in January 2004 until April 2017 were evaluated. All patients completed pre- and post-operative urodynamic studies, 1-hour pad test and validated quality of life (QOL) questionnaires at 1 year follow up. The objective and subjective cure of MUS outcomes were analysed in 4 different groups of pre-operative MUCP which were >60 cmH_20, ≤60 cmH_20 & ≥40 cmH_20, <40 cmH_20 & ≥20 cmH_20 and <20 cmH_20.

Results. All 3 generations of MUS showed good overall outcomes of both objective and subjective cure rate at 1 year; MUS-r 89.9% and 87.6%, TOT 89.5% and 87.9% and SIS 86.8% and 83.9%). Aging factor was significantly related to low MUCP. Intrinsic sphincter deficiency (ISD), functional urethral length <2 cm and bladder neck angle $<30^0$ were demographic parameters related significantly with MUCP <40 cmH_20 ($p < 0.001$ for each parameter). 48 patients with ISD were found only in pre-operative MUCP <40 cmH_20. Inferior outcomes were identified in two groups; MUCP <40 cmH_20 & ≥20 cmH_20 (76.5%, $p < 0.001$, 72.3% $p < 0.001$) and MUCP <20 cmH_20 (43.8%, $p < 0.001$ both objective and subjective cure) as compare to MUCP >60 cmH_20 (92.7% and 91.0%). ISD [OR 2.51 (1.62-4.32)], functional urethral length (FUL) <2 cm [OR 1.4 (1.13-2.09)] and bladder neck angle $<30^0$ [2.29 (2.02-4.23] were three independent risk factors associated with higher odds of MUS failure for women with pre-operative MUCP < 40 cmH_20.

Conclusions. We conclude that the lower the pre-operative MUCP value is, the poorer the MUS outcomes. MUCP <40 cmH_20 is a better cut-off level to predict inferior objective and subjective MUS cure outcomes of USI patients particularly with ISD. Overall, MUS procedure still has good surgical outcomes independent of its generation.

I-Chieh Sung 宋怡潔
(Y18)

Tape-releasing Suture with "Long Loop" on Mid-urethral Sling: a novel procedure for management of Iatrogenic Urethral Obstruction

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Objective: To report our experiences of a tape-releasing suture with "long-loop" in women with iatrogenic urethral obstruction following the mid-urethral sling procedure.

Methods: A total of 149 women underwent a tape-releasing suture with "Long Loop" during operation. Post-void residual volume was evaluated after Foley removal. Lower urinary tract symptoms and urodynamic studies were assessed before and six months postoperatively.

Results: Nine women out of 149 who underwent mid-urethral sling surgery were found to have iatrogenic urethral obstruction post-operatively based on their urinary symptoms and ultrasound findings. There was no apparent difference between tested groups in mid-urethral sling products and concomitant procedures. 77.8% had successful releases after the first Long-loop manipulation procedure, and 22.2% required two or more releases. However, the SUI cure rate is similar in groups receiving the Long-loop manipulation or not (88.9% and 87.1%, respectively).

Conclusions: We are convinced of the practicability and efficacy of the tape-releasing suture "Long-loop." We adopted subjective and objective means to evaluate both groups before and after a six-month follow-up. The Long-loop manipulation procedure can successfully resolve the iatrogenic urethral obstruction without compromising the effectiveness of mid-urethral sling for treatment of SUI.

Chieh-Yu Chang 張介禹
(Y19)

Urethral mobility is associated with postoperative de novo stress urinary incontinence following transvaginal mesh surgery

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Purpose: We aim to identify pre-operative ultrasound parameters related to de novo SUI following transvaginal mesh (TVM) surgery.

Materials and Methods: Medical records of 696 continent women with POP stage II to IV who received TVM surgery from January 2012 to December 2017 in our hospitals were recruited. Those who had concomitant mid-urethral sling surgery or incomplete medical records were excluded. Urinalysis, pelvic examination with POP quantification system (POP-Q), urodynamic study, personal interview using validated questionnaires (OABSS, UDI-6, and IIQ-7), and perineal ultrasound were all performed before and six months after TVM surgery.

Results: Of the remaining 92 continent women, 34 (36.9%) experienced de novo SUI after the operation. Women with the proximal urethral rotational angle > 20° (22.4% vs. 61.8%, p = 0.009) and the levator urethral gap at straining > 45 mm (58.6% vs. 82.4%, p = 0.027) reported a higher rate of de novo SUI postoperatively.

Conclusions: We found that women with proximal urethral rotational angle > 20° and the levator urethral gap at straining > 45 mm are associated with post-operative de novo SUI following TVM.

Yi-Chun Chou 周怡君
(Y20)

The mechanical property and tissue reaction of degradable hybrid Polycaprolactone mesh/drug-eluting Polycaprolactone nanofibers prolapse mats

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Introduction: An ideal mesh for POP repair should fulfill the following criteria: (1) have the adequate mechanical strength to support the pelvic floor; (2)possess favorable flexibility to assist implantation and fixation; (3) convey appropriate drug/growth factor concentrations to the target site for pain relief and infection control, as well as the formation of connective tissues; (4) be resorbable after fulfilling its function and be biocompatible such that the material degradation procedure would not lead to any tissue irritation. We developed hybrid degradable mesh/drug-eluting nanofibrous membranes for the repair of POP. Polycaprolactone (PCL) mesh was fabricated using a lab-developed solution-extrusion 3D printer, while estradiol-, lidocaine-, metronidazole-, and connective tissue growth factor (CTGF)-loaded poly (lactic-co-glycolic acid) (PLGA) core-shell nanofibers were prepared by employing electrospinning and coaxial electrospinning techniques.
Objective: We aim to observe the mechanical properties of 3D-printed meshes, the structure of the drug-loaded sheath-core nanofibers and profiles of pharmaceuticals/biomolecules from the nanofibers.
Methods: The mechanical properties of 3D-printed meshes were determined by a tensile tester. The structure of the drug-loaded sheath-core nanofibers was evaluated using scanning electron microscopy (SEM), transmission electron microscopy (TEM), and laser scanning confocal microscopy (LSCM). The release profiles of pharmaceuticals/biomolecules from the nanofibers were also assessed utilizing high-performance liquid chromatography (HPLC) and enzyme-linked immunosorbent assay (ELISA). In Vivo Animal Test were using ten Sprague-Dawley rats with implantation of PCL mesh/nanofibrous membranes. Five were sacrificed at 30 days for tensile properties. Another five were sacrificed at days-1, -4, -7, and -28 days for histological examination.
Results: The experimental results suggest that 3D-printed PCL meshes exhibited comparable strengths to commercial POP meshes and survived 2 through 10,000 cycles of fatigue test without breakage. Hybrid PCL meshes/PLGA nanofibrous membranes provided a sustainable release of metronidazole, lidocaine, and estradiol for 4, 25, and 30 days, respectively, in vitro. The membranes further liberated high levels of CTGF for more than 30 days. The animal tests show that the mechanical property of PCL mesh decreased with time, mainly due to degradation of the polymers post-implantation. No adverse effect of the mesh/nanofibers was noted in the histological images.
Conclusion: The mechanical properties of degradable meshes were compared to those of commercial non-degradable PP knitted macroporous ultra-lightweight implants, clinically employed for POP repair. The drug release behaviors of the mesh suggest that the meshes could sustainably release effective levels of estradiol, lidocaine, and metronidazole for 30, 25, and 4 days, respectively, in vitro. Meanwhile, the mesh also released high concentrations of connective tissue growth factor for over 30 days. Therefore, 3D-printed mesh/multi-drug-loaded nanofibrous membranes may provide advantages in terms of reduced postoperative complications as well as improved POP therapies.

Chia-Hsuan Yang **楊佳璇**
(Y21)

Comparison between anterior-apical mesh (Surelift) and anterior mesh (Surelift) in transvaginal pelvic organ prolapse surgery: Surgical and Functional Outcomes at 1 Year

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Introduction: The goal of this study is to evaluate the incidence of de novo/persistent USI of implanted mesh in women treated with anterior-apical mesh (Surelift-A) and the anterior mesh with sacrospinous ligament fixation (SSF, Surelift+SS) in extensive pelvic organ reconstruction surgery.

Material and Methods: The retrospective study conducted between April 2018 and February 2019 at Chang Gung Memorial Hospital. Patients had symptomatic anterior or apical prolapse with stage III or more and received Surelift+SS with modifications and Surelift-A were enrolled. 3-day voiding diary, validated quality-of-life questionnaires, undergone urodynamic study, real-time ultrasonography prior to the intervention as well as 12-month follow-up was completed. Primary outcome was the aspect of postoperative de novo SUI. Secondary outcomes were POP recurrence, QoL sexual function and major and minor complications. We defined cure of POP both subjectively and objectively. The POP-Q staging ≤1 indicated the subjective cure. Negative feedback to POPDI-6 questions 2 and 3 represented objective cure.

Result: 137 patients undergoing Surelift-A placement and 128 patients with Surelift+SS were enrolled. Demographics and clinical characteristics were compatible between groups. Overall prolapse correction were 97.1% and 97.7% for Surelift-A and Surelift+SS, respectively. Anterior and Apex compartment cure were 98.5%, 99.3% versus 98.4%, 99.2%. The subjective success were 92% in Surelift-A and 93.8% in Surelift+SS group. There was a significant difference at de novo USI/SUI with 28.8% for Surelift-A and 9.1% for Surelift+SS at one 1 year follow up. A lower MUCP in Surelift-A (50.4 cmH20) than Surelift+SSF (55.2 cmH2O) were observed. Concurrent MUS showed good outcomes for USI in both groups. Both BOO and DU were significantly improved postoperatively among the two groups. Mesh exposure is less in Surelift+SS (0.8%) than Surelift-A (4.4%).

Conclusion: The efficacy and safety both the pelvic reconstructive surgery using Surelift-A and Surelift+SS method for POP at one year were comparatively effective and safe. However, Surelift-A has higher incidence of de novo USI (28.8%) than using Surelift with SSF. In addition, mesh exposure is lower in Surelift+SS.

Yi-Ting Chen 陳怡婷
(Y22)

Rotational vaginal flaps in posterior vaginal wall prolapse reconstruction

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Objective: To assess the anatomical and functional outcome of a new surgical technique with rotational vaginal flaps to correct the posterior vaginal wall fascial defect.
Methods: The rotational vaginal flap for posterior compartment contained three entities from the fascia component of levator ani and perineal body. We named these fascia flaps by tissue origin or targeted tissue site. We called fascia of levator ani by trans-coccygeal flaps (pubo-coccygeal flap and ilio-coccygeal flap), which was named by the tissue origin. While we call fascia from the perineal body as the uterosacral flap (so-called USL flap), which means this rotational vaginal flap would finally target the position of the uterosacral ligament. All of the above flaps were assembled to the Ting-Chen flaps complex (TC flaps complex).
We retrospectively analyzed patients who underwent transvaginal pelvic reconstruction with native tissue repair for ≥ stage II and symptomatic posterior vaginal wall prolapse between January 2018 and December 2022. In posterior reconstruction with flaps group, we plicated the fascias of levator ani or repaired the posterior fascia defect with uterosacral flap and trans-coccygeal flap. Anatomical and functional outcomes were evaluated with clinical stage of POP-Q system and bowel incontinence assessment questionnaire in 2 months after operation. Analysis was done using Chi-Squared Test and Fisher exact test to assess the recurrence rate among each group. A p-value of 0.05 or lower is generally considered statistically significant.
Results: A total of 275 patients who underwent posterior reconstruction were included in this study. There were 2 groups according to different methods of posterior vaginal wall repair: Group A (traditional posterior colporrhaphy, 72 cases) and Group B (posterior reconstruction with rotational flaps, 203 cases). The median follow-up duration of each group was 29.4, 21.2 months. There were separately 14, and 11 patients who had recurrence of stage 2 posterior vaginal prolapse. Recurrence rate of each group is 19.44%, and 5.42%, the p-value is 0.000375. Further analysis to stage 2 prolapse, the recurrence rate of stage 2 prolapse in each groups is 14.58% and 1.89%, p-value is 0.0043. The recurrence rate of stage 3 or 4 prolapse in each group is 29.17 % and 9.28%, p-value =0.010015. No matter the severity of pre-operative stage, the rotational flaps had better anatomical outcomes than traditional posterior colporrhaphy.
In subgroup analysis, we divided group B into group B1 (posterior reconstruction with transcoccygeal flaps, 79 cases) and group B2 (posterior reconstruction with TC flaps complex, 124 cases). In anatomical outcome analysis, the recurrence rate of TC flaps complex was 2.42%, and recurrence rate of transcoccygeal flaps alone is 10.13%. p-value is 0.0252.
In bowel function assessment, we used questionnaires before operation and post-operative 2 Months to assess the constipation or incontinence condition. Both traditional posterior colporrhaphy and rotational flaps can make bowel function improved.
Conclusion: Posterior reconstruction with rotational flap seemed to have better anatomical and functional outcome than traditional posterior colporrhaphy, but more cases and longer follow-up time were needed.

Yu-Ting Lu 呂羽婷
(Y23)

The impact of biofeedback and electrostimulation-assisted pelvic floor muscle training on the change of sexual function in women with stress urinary incontinence

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Objective: To evaluate the impact of biofeedback and electrostimulation-assisted pelvic floor muscle training on the change of sexual function in women with stress urinary incontinence (SUI).

Materials and Methods: This retrospective cohort study was conducted at a single center in Taiwan from 2014 to 2021. We recruited 61 sexually active patients with urodynamically proven SUI in our study before the treatment. The short form of of the Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire (PISQ-12) was used to evaluate sexual function. Besides, the quality of life assessed by the Urogenital Distress Inventory (UDI-6) and Incontinence Impact Questionnaire (IIQ-7) and pelvic electrophysiological condition were compared before and after the treatments.

Results: Among 61 patients recruited, 47 patients completed those questionnaires. The sexual function measured by PISQ-12 revealed no significance after the last session of treatment ($p = 0.752$). Similarly, no improvement in sexual function were observed comparing the 6th, 12th, and 18th session with the baseline ($p = 0.357$, $p = 0.434$, $p = 0.236$, respectively). In contrast, the incontinence-related symptoms of distress, including the UDI-6 and IIQ-7 demonstrated significance comparing the 6th, 12th, 18th and the last treatment session to the baseline (UDI-6, all $p < 0.05$ and IIQ-7, all $p < 0.05$). Electrophysiological parameters of vaginal squeezing pressure, difference of vaginal resting and squeezing pressure, maximal voluntary contraction and duration of contraction were increased from the baseline to the last session ($p = 0.022$, $p < 0.001$, $p < 0.001$ and $p < 0.001$, respectively). However, for the vaginal resting pressure, there was no difference before and after the last treatment session ($p = 0.061$).

Conclusions: The treatment biofeedback and electrostimulation-assisted pelvic floor muscle training did not enhence the sexual function in women with stress urinary incontinence.

Pei-Chen Li 李佩蓁
(Y24)

Comparison of Er:YAG and CO2 laser therapy for women with stress urinary incontinence

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Objective: We compared the efficacy of Er:YAG and CO2 laser therapies for female stress urinary incontinence (SUI).

Materials and Methods: This retrospective study comprised 139 women divided into four groups: those who underwent two therapy sessions with the Er:YAG laser (group 1); two therapy sessions with the CO2 laser (group 2); one therapy session with the Er:YAG laser (group 3); and one therapy session with the CO2 laser (group 4). Each patient completed three questionnaires, which were used to assess SUI symptom severity at baseline, 1 month, and 3 months after laser therapy.

Results: Compared to the baseline results, urinary incontinence symptoms significantly improved in groups 1 (Er:YAG laser) and 2 (CO2 laser) at the 1- and 3-month follow-up evaluations ($p<0.001$). Symptoms improved after one therapy session for groups 3 (Er:YAG laser) and 4 (CO2 laser) at the 3-month follow-up ($p<0.001$). The Er:YAG laser showed better SUI symptoms improvement (Urogenital Distress Inventory 6 and Incontinence Impact Questionnaire 7) than the CO2 laser 3 months after treatment, regardless of the number of sessions. There was no significant difference in the overactive bladder symptom score of those who underwent treatment with the Er:YAG laser and CO2 laser. Two sessions of laser therapy were more effective than one.

Conclusion: Vaginal laser therapy could be an alternative treatment for mild to moderate SUI. The Er:YAG laser was more effective than CO2 laser therapy, with results lasting for at least 3 months. Further large-scale, randomized, controlled trials are required to confirm our results.