Neurogenic Bladder: problems and management

神经源性膀胱：相关问题和处理

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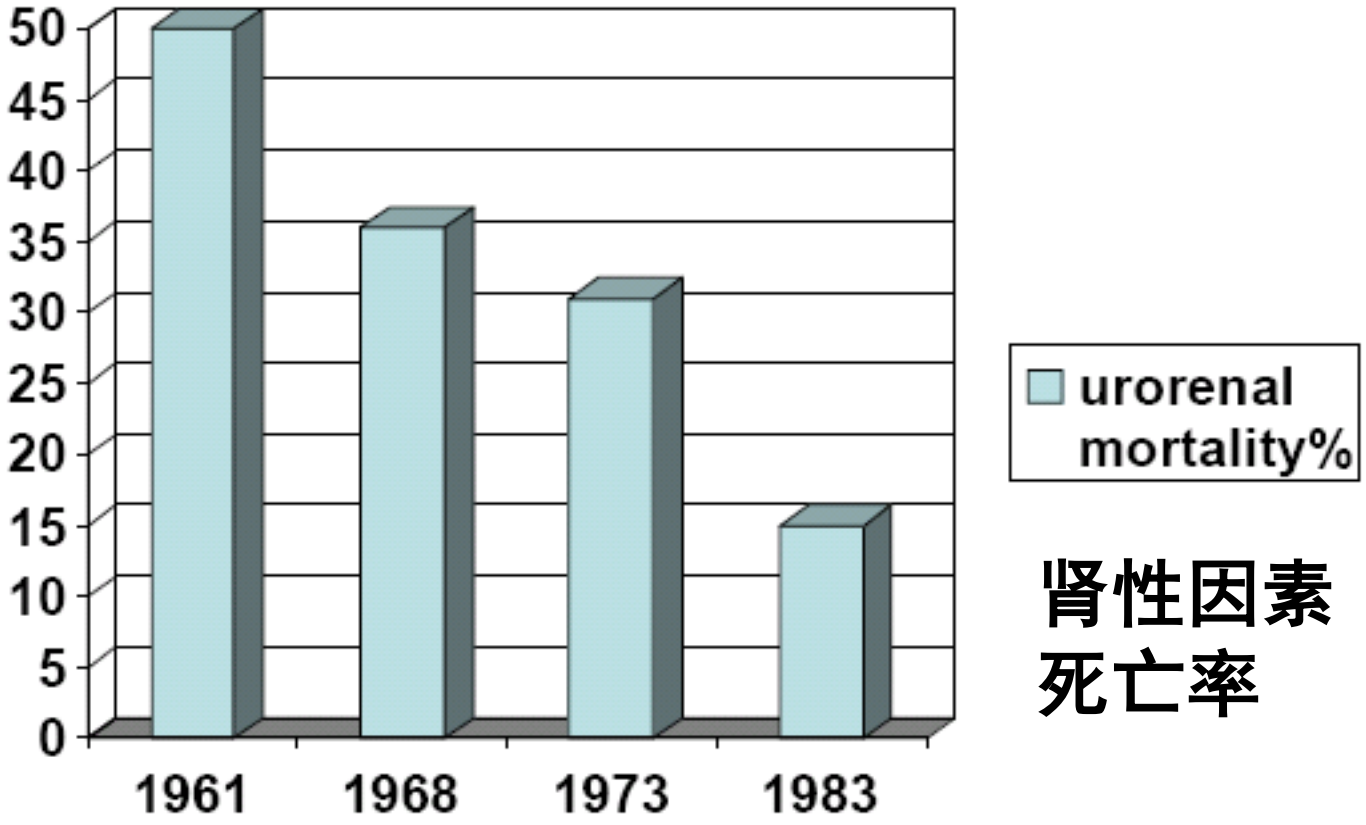
Aims of neurogenic bladder treatment
神经源性膀胱治疗目的

- **Safe the kidneys** = keep the patient alive
  保护肾功能 = 维系病人的生命
  - emptying of the bladder **排空膀胱**
  - avoid infection **避免感染**
- **Get the patient a good quality of life**
  提高病人的生活质量
  - no incontinence **无尿失禁**
  - easy way of emptying the bladder
    用简单的方法排空膀胱

History
肾性因素死亡率的演变



肾性因素死亡率

Knowledge 知识

1. Status upper tract (kidneys)

depends greatly on function of lower tract (bladder)

上尿路（肾脏）的状态很大程度上

取决于下尿路（膀胱）的功能

2. Importance of pressure in bladder
膀胱内压力的重要性

- **Pressure development during filling**

  贮尿期的压力变化
- **Pressure development during voiding**

  排尿期的压力变化

40 cm H20 is accepted as limit safe pressure 安全压力的上限是40厘米水柱

知识

Knowledge

3. Filling + emptying equally important
贮尿和排尿同等重要

- **Regular complete emptying needed for prevention infection and for continence**

  规律完全排空膀胱是预防感染和尿控的前提

Knowledge

4. Treatment needs to be optimal from day trauma

受伤当天开始就应治疗方案最佳化

Knowledge

5. No infection and completely continent

没有感染和完全尿控

\# 不等于

safe 安全

Actual guidelines for bladder management in SCL patients

目前脊髓损伤膀胱处理的指南

BASIC SCI DATA SETS

脊髓损伤基础数据集

www.iscos.org.uk & www.asia-spinalinjury.org

- **International Spinal Cord Injury Data Sets. Spinal Cord 2006 ;44:530-4.**

国际脊髓损伤数据集

- **International Spinal Cord Injury Core Data Set. Spinal Cord 2006 ;44:535-40.**

国际脊髓损伤核心数据集

- **International Lower Urinary Tract Function Basic Spinal Cord Injury Data Set. Spinal Cord 2008 ;46:325-30. 国际脊髓损伤下尿路功能基础数据集**
- **International urodynamic basic spinal cord injury data set. Spinal Cord 2008;46:513-6.**

国际脊髓损伤尿流动力学基础数据集

- **International urinary tract imaging basic spinal cord injury data set. Spinal Cord 2009; 47:379-83 国际脊髓损伤尿路影像基础数据集**

Acute period 急性期

The bladder management in the first weeks
can often determine
the lifelong outcome

最初几周的膀胱处理往往能决定病人的预后

NEED FOR PROPER CATHETER CARE

需要恰当的导管护理

Indwelling urethral catheterization (ID)
留置导尿

COMPLICATIONS. 并发症

- UTI **尿路感染**
- Urethral trauma and bleeding, urethritis, and fistula **尿道损伤，出血，尿道炎，尿瘘**
- Bladder neck incompetence, sphincter Erosion **膀胱颈松弛，括约肌糜烂**
- Bladder stones **膀胱结石**
- Bladder cancer **膀胱癌**
- Latex allergy **橡胶过敏**

COMPLICATIONS with ID 留置导尿的并发症

Urinary tract infection (UTI) 尿路感染

- UTI usually follows formation of biofilm on both the internal and external catheter surface.

  尿路感染通常伴随着导管内外壁生物膜的形成而产生

- In patients with long-term ID, febrile UTI varies from 1 per 100 to 1 per 1000 catheter days.

  对于长期留置导尿的病人，0.1–1%治疗日中会出现伴发热的尿路感染

COMPLICATIONS with ID 留置导尿的并发症

Urethral complications 尿道并发症

A pressure sore of the urethra associated with large sized catheters and improper fixation of the catheter develops abscess, fistula (A), diverticulum and iatrogenic hypospadias (B). **过粗的导尿管可导致尿道压疮，固定不当可导致脓肿、尿瘘(图A)、憩室及医源性尿道下裂(图B)。**

A: Urethral fistula

B: Iatrogenic hypospadias

COMPLICATIONS with ID 留置导尿的并发症

Bladder stones 膀胱结石

46-53% with long-term ID 46–53%的长期留置导尿者

Kidney stones 肾结石

bladder management !!! year 2 and later

膀胱管理！！！两年及以后

catheter-free < 2% within 5 years 五年内不使用导尿管的<2%

7% with ID 7%使用留置尿管

5% with condom catheters 5%使用阴茎套导尿管

5% in IC 间歇性导尿的有5%

3% in Suprapubic group. 耻骨上造瘘组3%

Complete injury independent risk for renal stone formation.

完全性损伤是肾结石形成的独立危险因素

COMPLICATIONS with ID 留置导尿的并发症

Latex Allergy 橡胶过敏

- Urethral catheters induce latex allergy leading to a life-threatening reaction.

  由导尿管引起的橡胶过敏症可威胁生命。
- Attention should be made to avoid latex materials when patients who have been managed with ID undergo surgery, especially through intraperitoneal approach.

  已留置尿管的患者接受手术时，应注意避免使用橡胶材料，尤其是腹膜内手术。

Prevention and Treatment of Complications with ID
留置导尿并发症的预防和处理

- A proper catheter protocol is essential in order to control and prevent complications.
  为了控制和预防并发症，制定恰当的导管操作规程是必要的。
- ID should be used as short a time as possible in the early stage.
  早期阶段应尽可能减少留置导尿的时间。

Prevention and Treatment of Complications with ID

留置导尿并发症的预防和处理

UTI and Genital infection 泌尿系统和生殖系统感染

- Use sterile materials and aseptic technique followed by the routine catheter care to maintain aseptic closed drainage system. 在常规导管护理程序中使用无菌材料和无菌技术，使引流系统保持无菌、密闭。
- Catheters should be changed regularly, if possible before obstruction or infection occurs. 导尿管应该定期更换，尽可能在阻塞或感染发生之前。
- If the patient has a symptomatic UTI, check catheter blockade and complication such as urinary stones. 如果病人罹患症状性尿路感染，应检查导尿管是否阻塞及是否发生尿路结石等并发症。
- Patients' education on daily cleanliness and hygiene care and a thoroughly urological check-up are mandatory. 必须对病人进行日常清洁、卫生护理方面的教育，并完成全面的泌尿系统检查。
- Symptomatic UTI should be treated with the most specific, narrowest spectrum antibiotics available for the shortest time.

  有症状的尿路感染应该在最短的时间内用最特异的和最窄谱的抗生素治疗。
- Bladder irrigation and antibiotic prophylaxis are not recommended as a routine infection-control measure. 膀胱冲洗和预防性抗生素不应成为常规控制感染的措施。

Prevention and Treatment of Complications with ID 留置导尿并发症的预防和处理

Urethral complications 尿道并发症

- Catheters with smaller size (12-14 F for men and 14-16 F for women), as large a lumen as possible and smaller (5-10 ml) self-retaining balloons are recommended to reduce the pressure effect on urethral surface and the bladder neck and to minimise obstruction of the urethral gland in men.
  建议尽可能选用小规格(男性12–14F，女性14–16F)、内径大和自留水囊较小(5–10ml)的导尿管，以减轻对尿道表面和膀胱颈的压力，并减少对男性尿道腺体的影响。

Type of neurogenic bladder after spinal cord lesion

脊髓损伤神经源性膀胱的分型

Special for every single patient

对单个病人来说是个体化及特殊的

分　类

- 1.尿失禁
- （1）由膀胱引起：
- 无抑制性收缩
- 容量减少
- 膀胱壁顺应性差
- 正常（认知/运动问题）
- （2）由出口引起：
- 膀胱颈压力降低
- 外括约肌压力降低

分　类

- 2.尿潴留
- （1）由膀胱引起：
- 逼尿肌反射消失
- 容量增大/顺应性高
- 正常（认知/运动问题）
- （2）由出口引起：
- 排泄压力高，流出率低
- 内括约肌协同失调
- 外括约肌协同失调
- 括约肌过度活动（括约肌协同失调）

分　类

- **3. 潴留与失禁**
- （1）由膀胱无抑制性收缩伴逼尿肌活动降低引起
- （2）逼尿肌括约肌失协调引起
- （3）正常（认知、运动问题）

治　疗

Conservative treatment overview

保守治疗概述

- **Behavioural therapy** 行为疗法

  B.1 Triggered reflex voiding 触发性反射排尿

  B.2 Bladder expression (Crede and Valsalva manouver)

  膀胱挤压(Crede按压法 和 Valsalva屏气法)

  B.3 Behavioural methods Toiletting assistance

  行为治疗 辅助用厕

- **Catheters** 导尿

  C.1 Intermittent catheterization 间歇导尿

  C.2 Indwelling catheterization 留置导尿

  C.3 Condom catheter and external appliances 阴茎套导尿管和外部装置

- **Pharmacotherapy** 药物治疗

- **Electrostimulation** 电刺激

  E.1 Electrical Neuromodulation 电神经调节

  E.2 Electrical stimulation of the pelvic floor musculature 盆底肌肉电刺激

  E.3 Intravesical electrical stimulation (IVES) 膀胱内电刺激

1. Triggered voiding **触发性排尿**

- Real potential danger !!!

  真正潜在的危险!!

- Limited role and in specific patients only

  使用范围有限，仅用于特殊患者

Triggered voiding 触发性排尿

- Best patient: synergic sphincter, easy triggered bladder contraction, pressure contraction not too high, contraction long enough, no incontinence

  最适合的病人：协调的括约肌，膀胱收缩易触发，收缩时压力不会过高，收缩时间足够长，无尿失禁。
- difficult to meet **这样的病人很难遇到**

2. Bladder expression 膀胱挤压

Dangerous !!!

Seldom applicable

危险！！！
很少使用

Bladder expression 膀胱挤压

- Best patient: easy emptying bladder at low pressure, limited incontinence, limited residual

  最适合的病人：用较低的压力即可轻松排空膀胱，尿失禁次数有限，残余尿量有限
- Difficult to meet **这样的病人很难遇到**

CIC and CISC
间歇性清洁导尿和自我间歇性清洁导尿

- Method of choice recommended for the management of neurologic bladder dysfunction **推荐作为神经源性膀胱功能障碍处理的首选方法**

ICI consultation
WHO et ICS
1999 2002 2005 2008 IC

IC education = extremely important
间歇性导尿教育极其重要

- Patient 病人
- Relatives 亲属
- Nurses 护士
- Doctors 医生
- PT 物理治疗师
- OT 作业治疗师

Good candidates for IC

适合间歇性导尿的病人

- **膀胱容量良好**
- **膀胱内低压力**
- **尿道有足够的阻力**

或通过药物、手术等方法能够创造这些条件的病人：

逼尿肌张力高：奥昔布林，654-2等

膀胱括约肌张力高：高特灵

Extra measures to control continence

其他的控尿方法

以下几点做到平衡：

- Fluid intake **液体摄入量：饮水表**
- Residual urine **残余尿量：正常压力范围或500ml左右**
- Frequency of catheterization
  导尿的频率：不大于6次最好

Bad candidates for IC

不适合间歇性导尿的病人

- Small bladder capacity **膀胱容量小**
- Severe incontinence **严重的尿失禁**
- Urethral obstruction **尿路梗阻**
- Infravesical infection **膀胱内感染**

Requirements for ISC

自我间歇性导尿的必要条件

- Meatus easy to reach 尿道口易触及
- Handfunction sufficient 手功能达到要求
- Mentally - physically able
  心理–生理上能接受
- Financially possible 经济条件允许

CIC and CISC

间歇性清洁导尿和自我间歇性清洁导尿

Results depend on technique

结果取决于技术

CIC technique 间歇性清洁导尿技术

- Mostly used: clean IC
  最常用：间歇性清洁导尿

- Special conditions : sterile non-touch
  特殊情况下：无菌非接触操作

CIC material

间歇性清洁导尿所需材料

- **Catheter　导尿管**
- **Desinfection (?)　消毒(?)**
- **Lubricant (?)　润滑(?)**
- **Special appliances　特殊用具**

General principles of catheterization

导尿的总原则

- Atraumatic **无损伤**
- Not introducing infectious **不导致感染**

Atraumatic catheterization
无创伤导尿术

- Normal size catheter **正常规格的导尿管**
- Lubricant (?) **润滑**(?)
- GOOD HANDLING **正确的操作手法**

Non infectious catheterization
无感染导尿术

- Meatus cleaned **清洁尿道口**
- Sterile catheter **无菌导尿管**
- Clean handling of catheter
  握持导尿管时无污染
- Complete bladder emptying **完全排空膀胱**
- Catheterization 4 - 6 x per day for IC and ISC
  每天间歇导尿或自我间歇导尿4–6次

When to start

何时开始？

Can be early after trauma (8-35 days)

受伤后(8–35天)早期开始

病情稳定，不多于500ml液体即可开始

New catheter each time ?

每次都用新导尿管吗？

Non hydrophilic re-sterilize or clean, if limited resouces, by

尽量使用一次性导尿管，如果经济条件有限，重复消毒和清洗非亲水性涂层的导尿管，可用如下方式☹卫生条件是避免感染的关键

- soaking in an antiseptic solution **用抗菌液浸泡**
- boiling water **沸水**
- Microwave rubber catheters in paper bag **橡胶导尿管放在纸袋中用微波消毒**

Urinary tract infection (UTI)

泌尿道感染

- Antibacterial prophylaxis
  fewer episodes of bacteriuria
  significantly more clinical UTI.

预防性应用抗生素时，菌尿虽然减少，但临床尿路感染发生率明显增高

- Risk factors for UTI in adults: increased bladder residual volume
  成人尿路感染的危险因素：膀胱残余尿量增加
- Risk factor for sepsis: previous management with ID
  败血症的危险因素：以前用过留置导尿
- symptomatic UTI = often improper CIC techniques or misuse
  症状性尿路感染，常常是由于间歇清洁导尿操作不当或滥用
- Chronic infection persists if the cause of the chronicity remains.

如果导致慢性感染的因素不能消除，慢性感染将会持续存在。

Prevention of UTI and Genital infection

泌尿系和生殖系感染的预防

- Avoid less frequent catheterization and bladder overfilling.
  避免导尿次数不够和膀胱过度充盈
- Empty the bladder completely without residual urine.
  完全排空膀胱，无残余尿
- Educate properly all involved in IC: good patient compliance, the use of a proper material and the application of a good catheterization technique.
  对与间歇导尿相关的所有人进行适当的教育：使病人有良好的依从性，使用合适的材料和正确的导尿技术

Prophylaxis 预防

- CIC 4-6 per day: 5 x less infection than 3 times a day **每天4–6次间歇性清洁导尿：每天导5次的感染发生率少于每天导3次的。**
- Prophylactic antibacterial : children, diabetes, reflux, diverticula.

  预防性使用抗生素：儿童，糖尿病人，尿液反流和憩室
- Danger for resistance **有产生耐药性的危险**

Urethral complications (urethral bleeding, false passage and urethral/meatal stricture)

尿道并发症（尿道出血，假道和尿道/尿道口狭窄）

- **Urethral bleeding** frequent new patients and 30 % long-term basis.
  新患者及30%长期治疗的病人尿道出血频繁
- **Trauma of the urethra** especially in men can cause **false passage**
  ≈ 30% - 40 % in long run with ordinary catheters
  尿道创伤可引起假道，对于男性来说尤为明显，约30% – 40%的患者在长期治疗中使用普通导尿管
- The incidence of urethral **stricture increase** 尿道狭窄发病率的增加
  - longer follow-up, > 20 % in 10 years with ordinary catheter
    长期随访，>20%的患者在10年内使用普通导尿管
  - higher catheterization rate 高导尿频率
  - ID had been used before introducing IC. 在开始间歇性导尿前使用留置导尿
- The surface of the catheter important factor with less stricture development when hydrophilic catheters are used. 导尿管的表面材料是重要的决定因素，使用亲水性导管可减少尿道狭窄的发生率。

Prevention of Urethral complications

预防尿道并发症

- To prevent urethral bleeding and urethral stricture
  预防尿道出血和尿道狭窄
  - gentle introduction of the catheter,
    轻柔插入导尿管
  - lubrication of the catheter, **润滑导尿管**
  - probably the use of hydrophilic catheters can play a role.
    可能亲水性导尿管能发挥一定的作用

Treatment of Complications with IC and ISC

间歇导尿和间歇自我导尿并发症的处理

- Treatment of UTI only when the infection is symptomatic.
  仅当尿路感染有症状时才给予治疗
- NO long-term prophylactic antibiotics to avoid resistant organisms.
  为避免产生耐药微生物，应避免长期预防性应用抗生素
- In neurogenic patients on CIC, urethral trauma and false passage successfully managed by 6-weeks indwelling catheter and 5 days antibiotics. **对于应用间歇清洁导尿的神经源性膀胱病人，尿道损伤和假道可通过留置导尿6周和使用5天抗生素来治愈。**
- Urethral stricture treated by urethral dilation or internal urethrotomy.
  通过尿道扩张和尿道内切开术治疗尿道狭窄。

Continuation of catheterization

导尿的长期应用

Of patients on CIC at discharge 52% discontinue the method and revert to indwelling catheter during follow-up.

间歇清洁导尿的病人在出院时有52%放弃了这种导尿方式，长期治疗又回到留置导尿。

Continuation of catheterization
Factors that have an influence

影响患者坚持导尿的因素

- Continence 尿控
- Autonomy for practising IC/dependence on care givers
  实施间歇性导尿的自主性/对照顾者的依赖性
- Surgery on sphincter and prostate 括约肌或前列腺手术
- Start spontaneous voiding 出现无意识排尿
- Young patients and females averse to CIC
  年轻患者或女性排斥间歇性清洁导尿
  - -subjective evaluation of their situation 对自身状况的主观臆断
  - -emotional status 情绪状态
  - -non-acceptance of their chronic disability. 不能接受终生残疾的事实
- Spasticity interfering with catheterization 痉挛妨碍导尿
- Lack of availability of external collective devices for female patients
  缺乏女性病人使用的外部集尿器

Patients on IC /ISC need regular and lifelong follow-up

用间歇导尿/间歇自我导尿的病人需要规律的终身随访

Follow up 随访

- Lifelong 终生
- Regularly: 1 Y to every 2 Y
  规律：1年 到 每2年
- Must include 必须包括
  - Imaging UT / function UT
    尿路影像学/尿路功能检查
  - Urine 尿液检查
  - Blood 血液检查
  - Urodynamics 尿流动力学检查
  - **Decision making 策略制定**

Conclusions 结论

- Urinary problems less dangerous for life expectancy than some decades ago **泌尿系问题对生命的威胁虽已较数十年前下降**
- Urinary problems still very much influencing quality of life
  但泌尿系问题对生活质量的影响仍然巨大
- Bladder management has many efficacious ways for diagnosis and treatment **有很多有效的诊断和治疗方法用于膀胱处理**
- Follow up is life long **随访是终身的**

TAKE HOME MESSAGES 重点

1. IC/SIC is the method of choice for NLUTD management, but it is complicated with UTI, genital infection, urethral complications and bladder stones. **间歇性导尿/自我间歇性导尿是治疗神经源性下尿路功能障碍的首选方法，但存在尿路感染、生殖系统感染、尿道并发症及膀胱结石等并发症。**

2. To prevent these complications, avoid less frequent catheterization and bladder overfilling and empty the bladder completely, and educate patients properly all involved in IC. **为预防这些并发症，应避免导尿频率过少和膀胱过度充盈，完全排空膀胱，并教育病人进行正确进行间歇导尿。**

TAKE HOME MESSAGES 重点

3. ID/SC are associated with UTI, urethral fistula, sphincter erosion, bladder stones and cancer, and latex allergy more frequently than IC/SIC. **留置导尿/耻骨上膀胱造瘘相关的尿路感染、尿瘘、括约肌糜烂、膀胱结石、膀胱癌、橡胶过敏症等并发症发生率比间歇性导尿/自我间歇性导尿高。**

4.A proper catheter protocol is essential in order to control and prevent complications. **为控制和预防并发症，制定恰当的导管操作规程是必要的。**

5.ID/SC should be used as short time as possible in the early stage.**早期阶段应尽可能减少留置导尿/耻骨上造瘘的时间。**

6.A proper catheter protocol is essential in order to control and prevent complications.**为控制和预防并发症，制定恰当的导管操作规程是必要的。**

TAKE HOME MESSAGES 重点

7. Bladder irrigation and antibiotic prophylaxis are not recommended as a routine infection-control measure. **不建议将膀胱冲洗和预防性应用抗生素作为常规的感染控制措施。**

8.Screening for bladder cancer is mandatory especially those with ID/SC more than 10 years. **膀胱癌筛查是必要的，特别是对那些留置导尿/耻骨上膀胱造瘘超过十年的病人。**

Thank you for the attention
谢谢大家

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