



## Article

# Laparoskopik va transvezikoskopik usullarda qilingan siydik naylari reimplantatsiyasi natijalarining qiyosiy sistematik tahlili

K.T. Ergashev <sup>\*1,2</sup> , S.T. Agzamxodjaev <sup>1,2</sup> , Z.B. Abdullaev <sup>1,2</sup> , A.A. Raxmatullaev <sup>3</sup> , K.Z. Hidoyatov <sup>1</sup> , A.T. Soliyev <sup>1</sup> , S.G'. Eshonqulov <sup>1</sup> , D.Sh. Xoltursunov <sup>2</sup> , B.N. Tilovov <sup>2</sup>

<sup>1</sup> Bolalar urologiyasi bo'limi, Bolalar milliy tibbiyot markazi, Toshkent shahri, 100007, O'zbekiston

<sup>2</sup> Bolalar urologiyasi kafedras, Toshkent Pediatriya Tibbiyot Instituti, Toshkent shahri, 100140, O'zbekiston

<sup>3</sup> Fakultet bolalar xirurgiyasi, bolalar anesteziologiyasi va reanimatsiyasi kafedras, Toshkent Pediatriya Tibbiyot Instituti, Toshkent shahri, 100140, O'zbekiston

davrik\_97@mail.ru (D.X.), asqarsoliyev@gmail.com (A.S.), drkhidoyatov@gmail.com (K.H.),

Doctor.bunyod@gmail.com (B.T.)

\* Correspondence: kobiljonergashev@gmail.com; Tel.: +998 99 5168179 (K.E.)

## Xulosa:

**Maqsad.** Ushbu sistematik tahlilda laparoskopik va transvezikoskopik siydik naylari reimplantatsiya bo'yicha mavjud maqolalar tahlil qilingan va ularning natijalari taqqoslangan.

**Materiallar va usullar.** Barcha tibbiy databazalar laparoskopik va transvezikoskopik siydik naylari reimplantatsiyasi bo'yicha qidirildi. Yakunlanmagan, takroriy va robot ishtirokida bajarilgan operatsiyalarni yorituvchi maqolalar chiqarib tashlandi. Bemor ko'rsatkichlari, refluks darajasi, tomoni, operatsiya davomiyligi, klinikada bo'lish vaqti, muvaffaqiyat darajasi va asorat ko'rsatkichlari o'rganildi.

**Natijalar.** 45 ta maqola ko'rilgandan so'ng 23 ta maqola (transvezikoskopik bo'yicha 13 ta, laparoskopik bo'yicha 10 ta maqola) ajratib olindi. V darajali refluks transvezikoskopik guruhda ko'proq uchradi (11.9%); laparoskopik guruhda esa (2.2%) ni tashkil etdi. Ikki tomonlama reimplantatsiya laparoskopik guruhga nisbatan transvezikoskopik guruhda aksariyat qismni egalladi. Unilateral/bilateral transvezikoskopik reimplantatsiyaga sarflangan vaqt ko'proqni tashkil etdi (155/194 minutga 107/161 minut). Klinikada bo'lish vaqti bo'yicha transvezikoskopik guruhda 3.2 kundan iborat bo'lgan bo'lsa, laparoskopik guruhda bu ko'rsatkich 1.6 kundan iborat bo'ldi. Asoratlarda bo'yicha ko'rsatkich: transvezikoskopikda 7.35%; laparoskopikda esa 5.35%.

**Xulosa.** Laparoskopik va transvezikoskopik usullar ochiq usuldagi operatsiyalarga o'rindosh bo'la oladi. Laparoskopik operatsiyalar unilaterial, I-IV darajali refluks holatlari uchun, muvaffaqiyat darajasi yuqoriroq va klinikada bo'lish vaqtining kamligi bilan ajralib turadi. Transvezikoskopik operatsiyalar esa ikki tomonlama va V darajali holatlar uchun qo'l keladi. Asoratlarda bo'yicha esa ikkala guruhda ham statistik farq aniqlanmadi.

**Kalit so'zlar:** qovuq-siydik nayi refluksi, siydik nayi reimplantatsiyasi, sistematik tahlil, laparoskopik xirurgiya, transvezikoskopik xirurgiya.

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## A Systematic review comparing outcomes of laparoscopic and transvesicostoscopic ureteroneocystostomy

Kobiljon T.Ergashev <sup>\*1,2</sup> , Saidanvar T.Agzamkhodjaev <sup>1,2</sup> , Zafar B.Abdullaev <sup>1,2</sup> , A.A. Raxmatullaev <sup>3</sup> , Kamron Z.Hidoyatov <sup>1</sup> , Asqar T.Soliyev <sup>1</sup> , Sarvar G'.Eshonqulov <sup>1</sup> , Davronbek Sh.Kholtursunov <sup>2</sup> , Bunyod N.Tilovov <sup>2</sup>

<sup>1</sup> Department of Pediatric Urology, National Children's Medical Center, Tashkent City, 100007, Uzbekistan

<sup>2</sup> Department of Pediatric Urology, Tashkent Pediatric Medical Institute, Tashkent, 100140, Uzbekistan

<sup>3</sup> Faculty Department of pediatric surgery, pediatric anesthesiology and resuscitation, Tashkent Pediatric Medical Institute, Tashkent, 100140, Uzbekistan

e-mail@e-mail.com (F.L.), e-mail@e-mail.com (F.L.), e-mail@e-mail.com (F.L.), e-mail@e-mail.com (F.L.,))

### Abstract:

**Background.** We have examined and compared the results of the articles on LEVUR and TVUR in this systematic review and meta-analysis.

**Materials and methods.** To find all the studies about TVUR and LEVUR in the pediatric population, we examined the databases. Exclusions were review articles, unfinished articles, duplicate publications, and robot-assisted publications. To determine patient information, reflux grades, laterality, length of operation, time to discharge, success rate, and complications, a systematic review was carried out.

**Results.** 23 articles -13 on TVUR and 10 on LEVUR - were included after a total of 45 articles were screened. In TVUR grade 5 VUR was substantially larger (11.9%,  $p = 0.001$ ) than in LEVUR (2.2%). When comparing TVUR to LEVUR, the percentage of bilateral reimplantation was considerably higher ( $p = 0.001$ ). 96.7% was the success rate of LEVUR, a considerable increase above TVUR 93.7% ( $p = 0.007$ ). Unilateral/bilateral TVUR took significantly longer duration of surgery (155/194 min vs 107/161 min) compared to LEVUR ( $p = 0.001$ ). The mean (s.d) time to discharge was longer at 3.2 (1.6) days for TVUR compared to 1.6 (0.4) days for LEVUR ( $p = 0.001$ ). The complication rate was comparable, 7.35% for TVUR and 5.35% for LEVUR ( $p = 0.167$ ).

**Conclusion.** With regard to success rates and side effects, LEVUR and TVUR appear to be reasonable substitutes for open ureteric reimplantation. Compared to TVUR, which was recommended for bilateral UR and grade 5 VUR patients, LEVUR was more preferable for unilateral, grades 1-4 cases, had higher success, and required a shorter hospital stay. Although the types of complications varied according to the procedure, there was no discernible difference in the complication rate between LEVUR and TVUR.

**Keywords:** vesico-ureteral reflux, ureteral reimplantation, systematic review, laparoscopic surgery, transvesicoscopic surgery.

### Kirish

Qovuq-siydik nayi reflyuksi kasalligida (QSR) siydik nayi reimplantatsiyasi (SNR) eng keng tarqalgan jarrohlik amaliyoti hisoblanadi. Minimal invaziv xirurgiyaning rivojlanishi bilan ohirgi yigirma yillikda antireflyuks amaliyotlari ochiq usuldan ko'proq endoskopik, laparoskopik yoki robotik usullarga ko'chmoqda [1]. Bu holat ochiq usuldagi SNR amaliyotlari ohirgi yarim asr davomida ancha standartlashgani va bu usul texnikasi yoki natijalari bo'yicha olamshumul maqolalar yozilmagani/yo'zib bo'lingani bilan bog'liq. Vang va hammualliflarning tekshiruviga ko'ra [2], minimal invaziv SNR amaliyotlari 2005 va 2012 yillar oralig'ida 1998-2004 davrga nisbatan 9 karra ko'paygan; ular, shuningdek, ochiq SNR amaliyotlarida nisbatan kamayish holatini ham aniqlaganlar. Ushbu trend ham minimal invaziv jarrohlik amaliyotlariga bo'lgan talabning oshib borayotganini ko'rsatadi. Laparoskopik ekstravezikal (LESNR) va transvezikoskopik (TVSNR) siydik nayi reimplantatsiyasi natijalari dunyo bo'yicha bir necha markazlar tomonidan o'rganilgan va chop etilgan va bizning maqolada ham aynan shu operativ yondashuv ko'rib o'tiladi.

Robot-assistlangan-xirurgiya dunyo bo'ylab ommalashgungacha [3,4] odatiy laparoskopik SNRning anti-QSR xirurgiyasida o'z o'rnini bor. Shuning uchun hozirgi kunda aynan qaysi usul: LESNR yoki TVSNRni tanlash ustida ko'plab muhokamalar kuzatilmoqda. TVSNR tarafdorlari [5-17] bu usul ikki tomonlama QSR uchun qulayligini olg'a sursalar, LESNR ihlosmandlari [18-27] laparoskopik instrumentlarni o'rganish vaqtining kamligi va operativ vaqtning qisqaligini vaj qilib keltiradilar. Shuning uchun ushbu ikki keng tarqalgan minimal invaziv SNR usullari natijalarini taqqoslashga ehtiyoj tug'ildi. Albatta, LESNR va TVSNR o'zining ko'rsatmalari, texnik ahamiyatli nuqtalari, ustunliklari va asoratlariga ega. Ushbu adabiyotlar sharhi bo'yicha maqolamiz aynan ikki usul LESNR-TVSNR borasida yozilgan barcha maqolalarni umumiy lashtirishga qaratiladi.

### Materiallar va usullar

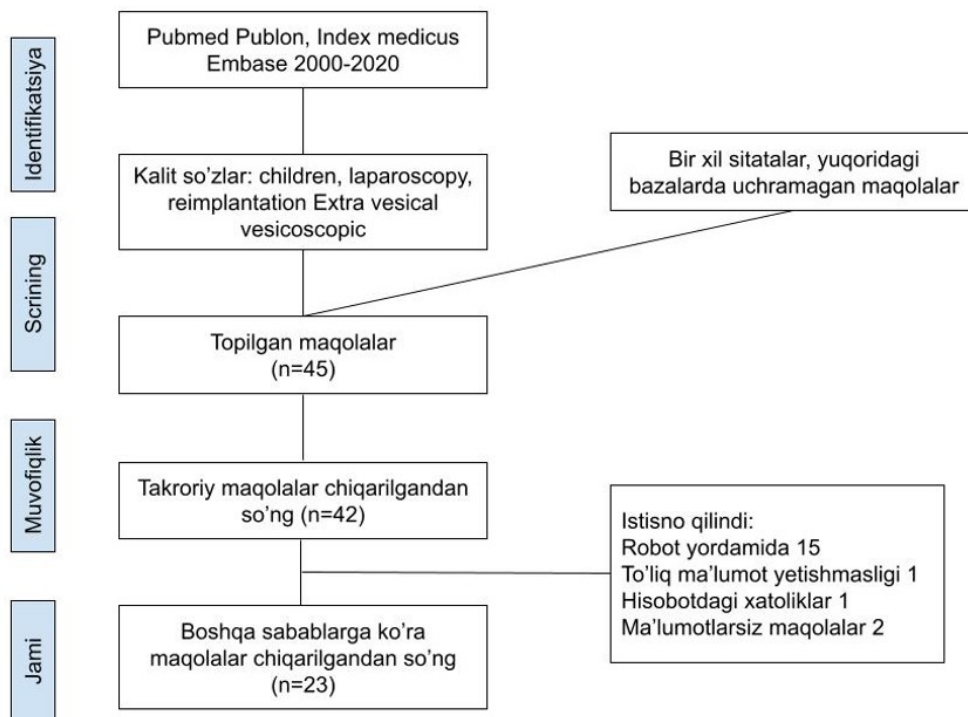
#### Qidirish strategiyasi

Ikki bir-biridan holi izlanuvchilar barcha data-bazalar: Pubmed, Publon, Index Medicus va Embase'larni quyidagi kalit so'zlar yordamida qidirdilar (bolalarda LESNR va TVSNR bo'yicha

barcha maqolalar): reimplantation (laparoscopic AND extravesical OR vesicoscopic) AND (child OR infant OR pediatric OR paediatric OR adolescent OR young).

#### Kiritish va chiqarish kriteriyalari

2001 va 2020 yillar davomida LESNR va TVSNR bo'yicha chop etilgan barcha prospektiv va retrospektiv maqolalar qamrab olindi. Barcha maqolalarda bemorlar yoshi 18 yoshgacha. Aksariyat maqolalarda Politano-Leadbetter usuli inobatga olingan bo'lsa, TVSNR bo'yicha maqolalarda Cohen usuli aks etgan. Inglizcha bo'lmagan, sharh maqolalari, klinik holatlar va o'quv-uslubiy maqolalar chiqarib tashlandi. Robot yordamida laparoskopik usulda bajarilgan operatsiyalar hisoboti chop etilgan maqolalar ham istisno qilindi (Figura 1).



**Figura 1.** PRISMA 2009 Format bo'yicha maqolalarni tanlash.

**Figure 1.** Selection of articles by format PRISMA 2009.

Ushbu maqola kriteriyalariga mos kelgan qolgan barcha maqolalar 6 xil hususiyat bo'yicha taqqoslandi: bemorlar/siydik naylari soni, QSR darajasi, operatsiya vaqti, muvaffaqiyat darajasi, klinikada bo'lgan vaqti va asoratlar.

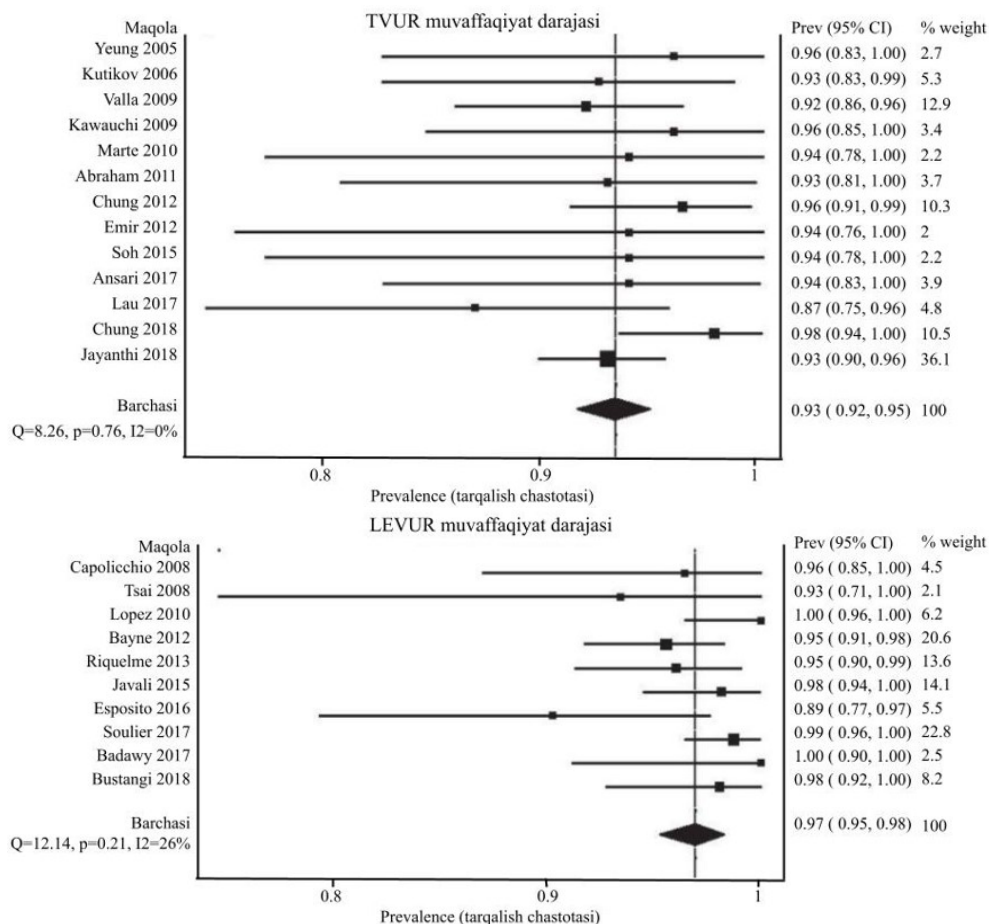
#### Natijalar

##### Muvaffaqiyat darajasi

Figura 2 LESNR va TVSNR guruhlaridagi har bir o'rganilgan maqola muvaffaqiyat darajasini va umumiy muvaffaqiyat darajasini ko'rsatadi. TVSNR guruhining umumiy muvaffaqiyat darajasi 93.7% (95% C.I. 91-95%) ni tashkil etgan bo'lsa, bu ko'rsatkich LESNR guruhida 96.7% (95% C.I. 94-98%) bo'ldi. LESNR guruhining 673/696 (96.7%) yuqori natijasi TVSNR guruhining 818/873 (93.7%) natijasiga nisbatan statistik ahamiyatli hisoblanadi ( $p = 0.007$ ).

##### Umumiy natijalar

Jadval 1 har bir maqolaning individual natijalarini ko'rsatsa, Jadval 2 esa ko'rsatkichlar natijasini taqqoslaydi. TVSNR guruhida bemorning o'rtacha operatsiya yoshi 5.5 yosh bo'lsa, LESNR guruhida esa bu ko'rsatkich 5.6 yoshni tashkil etadi va bu statistik ahamiyatli emas ( $p = 0.501$ ). V darajali QSR LESNR guruhiga (2.2%) nisbatan TVSNR guruhida (11.9%) yuqoriroq ko'rsatkich berdi ( $p = 0.001$ ). Ikki tomonlama reimplantatsiyalar TVSNR guruhida sezilarli darajada yuqori ko'rsatkichga ega bo'ldi ( $p = 0.001$ ).



**Figura 2.** TVSNR bo'yicha 13 ta maqola (yuqorigi rasm) va LESNR bo'yicha 10 ta maqola (pastki rasm) larda keltirilgan muvaffaqiyat darajalarini taqqoslash. Umumiy muvaffaqiyat darajasi 93.7% (TVSNR) va 96.7% (LESNR).

**Figure 2.** Comparison of success rates listed in 13 articles (top image) on TVSNR and 10 articles (bottom image) on LESNR. The overall success rate is 93.7% (TVSNR) and 96.7% (LESNR).

### Operatsiya vaqti

Bir tomonlama holatlarda operatsiya vaqti TVSNR guruhida 154 minutni tashkil etgan bo'lsa, huddi shu ko'rsatkich LESNR guruhida 107 minut bo'ldi. O'z navbatida, ikki tomonlama holatlar bo'yicha operatsiya vaqti TVSNR guruhida 194 minut va mos ravishda LESNR guruhida 161 minut. Bir va ikki tomonlama holat uchun TVSNR uzoqroq vaqt olgan ( $p=0.001$ ).

### Klinikada bo'lish vaqti

O'rtacha (SD) klinikada bo'lish vaqti TVSNR guruhi kasallari uchun 3.2 (1.6) kunni tashkil qildi; LESNR guruhi bemorlari holatida esa 1.6 (0.4) kun bo'ldi. Umumiy qilib aytganda, TVSNR kasallari klinikada uzoqroq muddat bo'lishgan ( $p=0.001$ ).

### Asoratlar

Asoratlar quyidagi jadvalda Clavien-Dindo klassifikatsiyasi [28] bo'yicha keltirilgan. Asoratlar foizi TVSNR guruhi uchun 7.35%; LESNR guruhi uchun 5.35%. Asoratlar darajasi TVSNR va LESNR guruhlar orasida statistik ahamiyatli emas ( $p=0.167$ ). TVSNR guruhida kuzatilgan 21/39 asoratlar portga bog'liq asoratlardir (port chiqishi, pnevmoperitoneum, emfizema va hk). LESNR guruhida kuzatilganlari orasida esa 9/28 siydik tutilishi holatlari, 9/28 holat esa detruzor miotomiyasi vaqtida gaz chiqishi holatlaridir.

**Table 1.** Systematic analysis of all data in 23 articles**Jadval 1.** 23 ta maqoladagi barcha ma'lumotlarning sistematik tahlili

| Muallif; yil     | Birlik son | O'rtacha yosh (yil) | Operatsiya vaqti (min) | Klinikada bo'lish vaqti (kun) | Muvaffaqiyat darajasi, % | Clavien I-IV asoratlari soni |
|------------------|------------|---------------------|------------------------|-------------------------------|--------------------------|------------------------------|
| TVSNR            |            |                     |                        |                               |                          |                              |
| Yeung 2005       | 23         | 4.1                 | 112 BT; 178 IT         | 1.90                          | 96                       | 2                            |
| Kutikov 2006     | 46         | 5                   | 168 IT                 | 1.90                          | 93                       | 3                            |
| Valla 2009       | 113        | 4.2                 | 82 BT; 130 IT          | 2.80                          | 92                       | 8                            |
| Kawauchi 2009    | 29         | 5                   | 145 BT; 230 IT         | 2.50                          | 96                       | 1                            |
| Marte 2010       | 19         | 7.6                 | 112 BT; 178 IT         | 3.00                          | 94                       | 1                            |
| Abraham 2011     | 32         | 2.2                 | 166 BT; 189 IT         | 3.00                          | 93                       | 1                            |
| Chung 2012       | 90         | 3.7                 | 155 IT                 | 1.60                          | 96                       | 3                            |
| Emir 2012        | 17         | 6.9                 | 217 BT; 306 IT         | 3.80                          | 94                       | 2                            |
| Soh 2015         | 19         | 15                  | 235 BT; 268 IT         | 3.4                           | 95                       | 1                            |
| Ansari 2017      | 34         | 4.6                 | 135 IT                 | 4.00                          | 94                       | 3                            |
| Lau 2017         | 42         | 6.1                 | 221                    | 7.40                          | 87                       | 4                            |
| Chung 2018       | 92         | 3.3                 | 147                    | 4.40                          | 98                       | 0                            |
| Jayanthi 2018    | 317        | 7                   | 169 BT; 197 IT         | 1.60                          | 93                       | 10                           |
| LESNR            |            |                     |                        |                               |                          |                              |
| Capolicchio 2008 | 31         | 7.3                 | ME                     | ME                            | 96                       | 2                            |
| Tsai 2008        | 14         | 3.4                 | 170 BT; 218 IT         | 1.4                           | 93                       | 1                            |
| Lopez 2010       | 43         | 4.4                 | 70 BT; 124 IT          | 1                             | 100                      | 2                            |
| Bayne 2012       | 144        | 6.7                 | ME                     | 1.7                           | 95                       | 6                            |
| Riquelme 2012    | 95         | 4.5                 | 105 BT; 180 IT         | 1.6                           | 96                       | 2                            |
| Javali 2015      | 98         | 9.5                 | 102 BT; 165 IT         | 1.5                           | 98                       | 3                            |
| Esposito 2016    | 38         | 4.8                 | 95 BT; 128 IT          | 2.4                           | 89                       | 2                            |
| Soulier 2017     | 159        | 3.9                 | 96 BT; 128 IT          | 1.2                           | 99                       | 3                            |
| Badawy 2017      | 17         | 5                   | 90 BT                  | 2                             | 100                      | 3                            |
| Bustangi 2018    | 57         | 4.2                 | 127 BT; 184 IT         | 1.6                           | 98                       | 4                            |

\* BT - Bir tomonlama; IT - Ikki tomonlama; ME - Mavjud emas.

### Munozara

Qamrab olingan va o'rganilgan maqolalarda keltirib o'tilgan operatsiya metodlaridan LESNR bu ekstravezikal Lich-Gregoir texnikasining bir modifikatsiyasi; TVSNR esa intravezikal Cohen texnikasining bir modifikatsiyasi hisoblanadi.

Bemor tanlashda TVSNR guruhida ikki tomonlama reimplantatsiyalar ko'proq kuzatilgan. V darajali QSR LESNR guruhida nisbatan kam kuzatilgan va bu TVSNR guruhida V darajali QSR va ikki tomonlama reimplantatsiyalarning ko'pligi bilan tushuntiriladi. Esposito va hammualliflar [22] II-IV darajali QSRga endoskopik inyeksiya yoki LESNR qo'llashgan, ular fikricha V darajali QSR uchun ochiq usulda bajarilgan Cohen operatsiyasi ko'proq mos keladi. Shuningdek, ikki tomonlama holatlarda LESNR usulini kam qo'llash u qo'llangan holatda operatsiyadan keyin siydik tutilishi kuzatilishi bilan bog'liq. Shu nazariyani qo'llagan holda shuni aytish mumkinki, bizning analizda LESNR holatlarida siydik tutilishi kuzatilgan bo'lsa, TVSNR guruhida bunday asorat umuman uchramaydi.

Operatsiya vaqti bir va ikki tomonlama holatlarning har ikkisida ham TVSNR guruhida nisbatan uzoqroq vaqtni oladi. Bu portlarni joylashtirish va qovuqni qorin old devoriga mustahkamlash jarayonlarining nisbatan ko'proq vaqt olishi bilan tushuntiriladi. Bu qadamning muhimligi TVSNR guruhida kuzatilgan asoratlarning aksariyati (21/39) port bilan bog'liq ekanligini ko'rsatadi. Qovuq devori fiksatsiyasining turli xil usullari mavjud [8,9,13], ammo hozirgi kunda aynan bir usulning boshqasidan ustunligini ko'rsatish juda qiyin. Port sirpanib chiqishi va buning oqibatida yetarli miqdorda pnevmovezika hosil qila olmaslik TVSNRning asosiy muammolaridan biri. Portni joylashtirish va fiksatsiyasidan tashqari, TVSNR guruhida nisbatan V darajali QSR sonining ko'pligi ham operatsiya davomiyligi uzoq bo'lishiga olib keladi. V darajali QSRda kengaygan va ilon-izisimon siydik nayini ajratish va modifikatsiya qilish, tabiiyki, ko'p vaqt talab qiladi.

Ushbu maqolamizda LESNR va TVSNR usullarning har ikkida kuzatilgan muvaffaqiyat darajasi avval chop etilgan maqolalardagi [30] kabi sonlarga mos tushadi. Shunday bo'lsada, LESNR muvaffaqiyat darajasi sezilarli darajada TVSNR darajasidan yuqori. Ushbu farq LESNR guruhida bir tomonlama holatlarning ko'pligi va V darajali QSRning kamligi bilan tushuntiriladi.

O'rtacha operatsiyadan keyin klinikada bo'lish vaqti LESNR guruhida deyarli 50%ga kamroq. Bu ayniqsa, bir tomonlama holatlar uchun juda katta ustunlik beradi. Port o'rinlaridan siydik chiqishi kuzatilishi TVSNR guruhi bemorlarining klinikada uzoqroq qolishiga sabab bo'lgan bo'lishi mumkin.

Ikkala guruhda ham asorotlar foizi nisbatan bir-biriga yaqin bo'lsada, LESNR guruhida operatsiyadan keyingi siydik tutilishi, ayniqsa ikki tomonlama holatlar uchun, asosiy muammolardan biridir. Ohirgi yillarda nerv zararlanishini oldini oluvchi usullarning rivojlanishi natijasida siydik tutilishi kuzatilishi nisbatan kamaymoqda [25]. TVSNR guruhida eng ko'p tarqalgan asoratlardan bu port chiqib ketishi, port o'rnidan gaz chiqishi (pnevmooperitoneum, emfizema) yoki port-o'rniga gematomasi rivojlanishi kabilarni keltirib o'tish mumkin.

### **Xulosa**

Xulosa o'rnida LESNR va TVSNR muvaffaqiyat darajasi va asorotlar ko'rsatkichi bo'yicha ochiq usulda o'tkazilayotgan reimplantatsiya amaliyotlariga juda yaxshi alternativ bo'la oladi. LESNR bir tomonlama holatlar, I-IV darajali QSRlar uchun, muvaffaqiyat darajasi yuqoriroq va klinikada qolish vaqti nisbatan kamroq usuldir; o'z o'rnida TVSNR ikki tomonlama holatlar va V darajali QSR holatlari uchun mos usul hisoblanadi. Asorotlar uchrashi borasida har ikki guruhda ham bir xil darajali ko'rsatkichlarni uchratish mumkin.

### **Mualliflarning hissalari K**

onseptualizatsiya, K.E.; S.A.; metodologiya, K.E.; dasturiy ta'minot, K.E.; tasdiqlash, K.E.; S.A.; Z.A.; formal tahlil, K.E.; tadqiqot, K.E.; Z.A.; A.R.; resurslar, A.S.; S.E.; D.X.; B.T.; ma'lumotlarni kuratorlik qilish, K.E.; original matnni yozish, K.E.; yozish va tahrirlash, K.E.; S.A.; vizualizatsiya, K.E.; rahbarlik, K.H.; loyiha boshqaruvi, S.A.; moliya jalb qilish, S.A. Barcha mualliflar nashr etilgan qo'lyozmaning yakuniy versiyasini ko'rib chiqqan va uning mazmuni bilan rozilik bildirgan.

### **Authors' contribution.**

Conceptualization, K.E.; S.A.; Methodology, K.E.; Software, K.E.; Validation, K.E.; S.A.; Z.A.; Formal analysis, K.E.; Investigation, K.E.; Z.A.; A.R.; Resources, A.S.; S.E.; D.X.; B.T.; Data curation, K.E.; Writing – original draft, K.E.; Writing – review editing, K.E.; S.A.; Visualization, K.E.; Supervision, K.H.; Project administration, S.A.; Funding acquisition, S.A. All authors have reviewed and approved the final version of the manuscript.

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Ushbu tadqiqot etika tamoyillariga zid bo'lmagan.

### **Ethics approval.**

This study did not violate ethical principles.

### **Nashrga xabardor qilingan rozilik.**

Ushbu maqolani chop etish uchun bemorlardan yozma ma'lumotli rozilik olingan.

### **Consent for publication.**

Written informed consent for publication was obtained from the patients.

### **Ma'lumotlar mavjudligi to'g'risidagi bayonot**

Yangi ma'lumotlar yaratilmagan.

### **Data Availability Statement**

No new data were created.

## Rahmatnomalar

Ushbu ish davomida ma'muriy yordam sifatida Bolalar milliy tibbiyot markazi xodimlari tomonidan tashkilotchilik va ma'lumotlarni boshqarish bo'yicha ko'mak ko'rsatildi. Shuningdek, laboratoriya tajribalari uchun kerakli materiallar va uskunalar in-kind tarzida taqdim etildi. Mualliflar ushbu yordam uchun minnatdorlik bildirishadi.

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Mualliflar o'zlarining manfaatlar to'qnashuvi yo'qligini e'lon qiladilar. Homiyar tadqiqotni loyihalashda ishtirok etmagan; ma'lumotlarni to'plash, tahlil qilish yoki sharhlashda; qo'lyozmani yozishda yoki natijalarni nashr etish to'g'risida qaror qabul qilishda.

## Conflict of interest

The authors declare that they have no conflicts of interest. The funders had no role in the design of the study; in the collection, analysis, or interpretation of data; in writing the manuscript; or in the decision to publish the results.

## Qisqartmalar

|       |                                                          |
|-------|----------------------------------------------------------|
| QSR   | Qovuq-siydik nayi reflyuksi                              |
| SNR   | Siydik nayi reimplantatsiyasi                            |
| LESNR | Laparoskopik ekstravezikal siydik nayi reimplantatsiyasi |
| TVSNR | Transvezikoskopik siydik nayi reimplantatsiyasi          |
| UR    | Ureteral reimplantatsiya                                 |

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Barcha nashrlarda keltirilgan bayonotlar, fikrlar va ma'lumotlar faqat mualliflar va ishtirokchilarga tegishlidir, na Jurnal va na muharrirlar. Jurnal va muharrirlar, mazkur kontentda keltirilgan har qanday g'oyalar, usullar, ko'rsatmalar yoki mahsulotlar natijasida insonlar yoki mulkka yetkazilgan har qanday zarar uchun javobgar emas.

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