Impact of Nephron Sparing Surgery on survival in upper urinary tract urothelial carcinoma patients stratified by tumor characteristics

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| **Table S1. Life of the 5-year and 10-year overall survival and cancer-specific survival rates.**  |
| **Characteristic** | **OS** | **CSS** |
| **3-year OS (%)** | **5-year OS (%)** | **10-year OS (%)** | **3-year CSS (%)** | **5-year CSS (%)** | **10-year CSS (%)** |
| Grade I |  |  |  |  |  |  |
| No surgery | 24.5  | 10.1  | 3.3  | 62.3  | 62.5  | 60.2  |
| NSS | 78.2  | 64.6  | 40.6  | 93.2  | 91.5  | 86.1  |
| RNU | 76.1  | 63.1  | 39.9  | 93.1  | 91.2  | 84.5  |
| Grade II |  |  |  |  |  |  |
| No surgery | 24.0  | 12.1  | 8.2  | 49.5  | 38.2  | 35.3  |
| NSS | 72.6  | 63.1  | 32.1  | 91.3  | 88.7  | 85.2  |
| RNU | 75.9  | 63.3  | 39.5  | 89.5  | 85.4  | 78.3  |
| Grade III |  |  |  |  |  |  |
| No surgery | 8.8  | 4.5  | 1.8  | 22.5  | 18.1  | 15.2  |
| NSS | 58.3  | 46.5  | 27.1  | 82.1  | 78.5  | 66.6  |
| RNU | 50.3  | 37.1  | 22.8  | 71.4  | 63.9  | 55.4  |
| Grade IV |  |  |  |  |  |  |
| No surgery | 12.6  | 6.2  | 2.2  | 27.7  | 21.2  | 18.4  |
| NSS | 55.8  | 41.6  | 24.1  | 79.1  | 72.8  | 63.2  |
| RNU | 50.9  | 38.5  | 23.6  | 71.8  | 64.1  | 55.2  |
| StageⅠ |  |  |  |  |  |  |
| No surgery | 31.2  | 15.3  | 6.1  | 62.9  | 55.2  | 50.1  |
| NSS | 75.2  | 63.6  | 40.3  | 92.8  | 90.5  | 84.6  |
| RNU | 79.3  | 65.6  | 43.1  | 93.2  | 89.3  | 84.2  |
| Stage Ⅱ |  |  |  |  |  |  |
| No surgery | 6.9  | 5.4  | 3.1  | 45.3  | 40.2  | 33.2  |
| NSS | 69.3  | 53.1  | 20.8  | 88.6  | 84.2  | 77.6  |
| RNU | 65.1  | 49.7  | 28.4  | 85.5  | 79.1  | 70.1  |
| Stage Ⅲ |  |  |  |  |  |  |
| No surgery | 15.1  | 3.7  | 2.2  | 42.2  | 21.7  | 10.3  |
| NSS | 44.2  | 33.9  | 22.4  | 72.3  | 66.6  | 55.2  |
| RNU | 51.9  | 37.9  | 23.2  | 73.3  | 64.3  | 55.3  |
| Stage Ⅳ |  |  |  |  |  |  |
| No surgery | 5.1  | 2.7  | 0.9  | 14.2  | 10.5  | 5.2  |
| NSS | 33.4  | 20.8  | 16.3  | 57.1  | 48.2  | 20.1  |
| RNU | 22.0  | 14.9  | 8.7  | 40.4  | 31.6  | 18.3  |
| Abbreviations: OS: Overall Survival; CSS: Cancer Specific Survival; NSS: Nephron Sparing Surgery; RNU: Radical Nephroureterectomy. |

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| **Table S2. Subgroup analyses stratified by summary stage and grade for overall survival and cancer-specific survival in renal pelvis group.** |
| **Characteristic** | **OS** | **CSS** |
| **Hazard Ratio (95% CI)** | ***P value*** | **Hazard Ratio (95% CI)** | ***P value*** |
| Grade I |  |  |  |  |
| No surgery | 3.50(2.13-5.74) | <0.001 | 3.26 (1.20-8.88) | 0.021  |
| NSS | 0.96 (0.44-2.10) | 0.923 | 1.48 (0.24-9.33) | 0.677  |
| RNU | Reference |  | Reference |  |
| Grade II |  |  |  |  |
| No surgery | 3.23 (2.30-4.53) | <0.001 | 3.35 (2.02-5.56) | <0.001 |
| NSS | 1.00 (0.64-1.56) | 0.999 | 0.92 (0.40-2.12) | 0.853  |
| RNU | Reference |  | Reference |  |
| Grade III |  |  |  |  |
| No surgery | 2.21 (1.84-2.65) | <0.001 | 2.37 (1.87-2.99) | <0.001 |
| NSS | 0.91 (0.70-1.17) | 0.456 | 0.65 (0.42-1.02) | 0.063  |
| RNU | Reference |  | Reference |  |
| Grade IV |  |  |  |  |
| No surgery | 2.00 (1.71-2.36) | <0.001 | 2.07 (1.68-2.55) | <0.001 |
| NSS | 0.97 (0.75-1.25) | 0.801 | 0.94 (0.64-1.40) | 0.772  |
| RNU | Reference |  | Reference |  |
| StageⅠ |  |  |  |  |
| No surgery | 3.38 (2.74-4.18) | <0.001 | 4.19 (2.73-6.45) | <0.001 |
| NSS | 1.14 (0.85-1.53) | 0.382 | 1.24 (0.70-2.19) | 0.466  |
| RNU | Reference |  | Reference |  |
| Stage Ⅱ |  |  |  |  |
| No surgery | 3.24 (2.11-4.97) | <0.001 | 3.64 (1.45-9.16） | 0.006 |
| NSS | 1.03 (0.68-1.55) | 0.901 | 0.42 (0.13-1.34） | 0.144  |
| RNU | Reference |  | Reference |  |
| Stage Ⅲ |  |  |  |  |
| No surgery | 2.22 (1.72-2.88) | <0.001 | 2.01 (0.74-5.46) | 0.171 |
| NSS | 0.89 (0.68-1.14) | 0.35 | 0.80 (0.51-1.25) | 0.327  |
| RNU | Reference |  | Reference |  |
| Stage Ⅳ |  |  |  |  |
| No surgery | 1.92 (1.54-2.40) | <0.001 | 2.08 (1.77-2.44) | <0.001 |
| NSS | 0.64 (0.39-1.05) | 0.077 | 0.73 (0.46-1.17) | 0.195  |
| RNU | Reference | 　 | Reference | 　 |
| Abbreviations: OS: Overall Survival; CSS: Cancer Specific Survival; NSS: Nephron Sparing Surgery; RNU: Radical Nephroureterectomy. |

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| **Table S3. Subgroup analyses stratified by summary stage and grade for overall survival and cancer-specific survival in ureter group.** |
| **Characteristic** | **OS** | **CSS** |
| **Hazard Ratio (95% CI)** | ***P value*** | **Hazard Ratio (95% CI)** | ***P value*** |
| Grade I |  |  |  |  |
| No surgery | 4.36 (2.04-9.36) | <0.001 | 11.30 (1.28-9.59) | 0.029  |
| NSS | 0.99 (0.57-1.69) | 0.959 | 0.98 (0.23-4.27) | 0.983  |
| RNU | Reference |  | Reference |  |
| Grade II |  |  |  |  |
| No surgery | 3.78 (2.39-5.99) | <0.001 | 4.83 (2.12-11.03) | <0.001 |
| NSS | 0.97 (0.74-1.29) | 0.857 | 0.53 (0.26-1.06) | 0.074  |
| RNU | Reference |  | Reference |  |
| Grade III |  |  |  |  |
| No surgery | 2.06 (1.63-2.60) | <0.001 | 2.60 (1.87-3.62) | <0.001 |
| NSS | 0.82 (0.68-0.99) | 0.034 | 0.75 (0.55-1.03) | 0.078  |
| RNU | Reference |  | Reference |  |
| Grade IV |  |  |  |  |
| No surgery | 2.73 (2.20-3.39) | <0.001 | 3.70 (2.74-5.01) | <0.001 |
| NSS | 0.99 (0.85-1.15) | 0.861 | 0.83 (0.64-1.06) | 0.136  |
| RNU | Reference |  | Reference |  |
| StageⅠ |  |  |  |  |
| No surgery | 3.37 (2.64-4.32) | <0.001 | 5.51 (3.54-8.58) | <0.001 |
| NSS | 0.91 (0.73-1.12) | 0.368 | 0.71 (0.43-1.16) | 0.174  |
| RNU | Reference |  | Reference |  |
| Stage Ⅱ |  |  |  |  |
| No surgery | 4.12 (2.07-8.20) | <0.001 | 8.41 (3.18-22.23) | <0.001 |
| NSS | 0.91 (0.75-1.11) | 0.351 | 0.76 (0.52-1.10) | 0.149  |
| RNU | Reference |  | Reference |  |
| Stage Ⅲ |  |  |  |  |
| No surgery | 2.06 (1.30-3.26) | 0.002 | 2.83 (1.51-5.32) | 0.001 |
| NSS | 1.08 (0.90-1.30) | 0.423 | 0.90 (0.66-1.22) | 0.482  |
| RNU | Reference |  | Reference |  |
| Stage Ⅳ |  |  |  |  |
| No surgery | 1.80 (1.45-2.23) | <0.001 | 2.20 (1.66-2.90) | <0.001 |
| NSS | 0.77 (0.59-1.01) | 0.063 | 0.72 (0.49-1.07) | 0.104  |
| RNU | Reference | 　 | Reference | 　 |
| Abbreviations: OS: Overall Survival; CSS: Cancer Specific Survival; NSS: Nephron Sparing Surgery; RNU: Radical Nephroureterectomy. |

**Supplemental Figure**



**Supplemental Figure 1.** Overall survival and cancer-specific survival curves of UTUC patients according to surgical method in different Grades in renal pelvis group. **A** and **B**, Overall survival (left) and cancer-specific survival (right) in Grade Ⅰ patients. **C** and **D**, Overall survival (left) and cancer-specific survival (right) in Grade Ⅱ patients. **E** and **F**, Overall survival (left) and cancer-specific survival(right) in Grade Ⅲ patients. **G** and **H**, Overall survival (left) and cancer-specific survival (right) in Grade Ⅳ patients. C.E, cumulative number of events; N.R, number at risk.



**Supplemental Figure 2.** Overall survival and cancer-specific survival curves of UTUC patients according to surgical method in different Grades in renal pelvis group. **A** and **B**, Overall survival (left) and cancer-specific survival (right) in Stage Ⅰ patients. **C** and **D**, Overall survival (left) and cancer-specific survival (right) in Stage Ⅱ patients. **E** and **F**, Overall survival (left) and cancer-specific survival (right) in Stage Ⅲ patients. **G** and **H**, Overall survival (left) and cancer-specific survival (right) in Stage Ⅳ patients. C.E, cumulative number of events; N.R, number at risk.



**Supplemental Figure 3.** Overall survival and cancer-specific survival curves of UTUC patients according to surgical method in different Grades in ureter group. **A** and **B**, Overall survival (left) and cancer-specific survival (right) in Grade Ⅰ patients. **C** and **D**, Overall survival (left) and cancer-specific survival (right) in Grade Ⅱ patients. **E** and **F**, Overall survival (left) and cancer-specific survival(right) in Grade Ⅲ patients. **G** and **H**, Overall survival (left) and cancer-specific survival (right) in Grade Ⅳ patients. C.E, cumulative number of events; N.R, number at risk.



**Supplemental Figure 4.** Overall survival and cancer-specific survival curves of UTUC patients according to surgical method in different Grades in ureter group. **A** and **B**, Overall survival (left) and cancer-specific survival (right) in Stage Ⅰ patients. **C** and **D**, Overall survival (left) and cancer-specific survival (right) in Stage Ⅱ patients. **E** and **F**, Overall survival (left) and cancer-specific survival (right) in Stage Ⅲ patients. **G** and **H**, Overall survival (left) and cancer-specific survival (right) in Stage Ⅳ patients. C.E, cumulative number of events; N.R, number at risk.