**Supplementary Table S1** Impact of body mass index (BMI) on diagnostic performance of transrectal USG to assess pelvic lymph nodes

| Detection of pelvic node macrometastases and/or micrometastases (pN1) | | | | |
|---|---|---|---|---|
| | BMI < 25 (N = 197) | | BMI ≥ 25 (N = 193) | |
| | Results | 95% confidence interval | Results | 95% confidence interval |
| **Sensitivity** | 61.0 % | 46.0 % – 75.9 % | 44.1 % | 27.4 % – 60.8 % |
| **Specificity** | 91.7 % | 87.3 % – 96.0 % | 96.2 % | 93.3 % – 99.2 % |
| **PPV** | 65.8 % | 50.7 % – 80.9 % | 71.4 % | 52.1 % – 90.8 % |
| **NPV** | 89.9 % | 85.3 % – 94.6 % | 89.0 % | 84.3 % – 93.6 % |
| **ACC** | 85.3 % | 80.3 % – 90.2 % | 87.0 % | 82.3 % – 91.8 % |
| **AUC** | 0.763 | 0.668 – 0.858 | 0.702 | 0.589 – 0.815 |
| **DOR** | 17.2 | 7.4 – 40.1 | 20.1 | 7.0 – 58.1 |

Comparison of sensitivity: p = 0.144, comparison of specificity: p = 0.089

Legend: BMI – body mass index, PPV – positive predictive value, NPV – negative predictive value, ACC – accuracy, AUC – area under curve, DOR – diagnostic odds ratio, BMI – body mass index

**Supplementary Table S2** Impact of histological type on diagnostic performance of transrectal USG to assess pelvic lymph nodes

| Detection of pelvic node macrometastases and/or micrometastases (pN1) | | | | |
|---|---|---|---|---|
| | Squamous cell carcinoma (N = 292) | | Adenocarcinoma (N = 81) | |
| | Results | 95% confidence interval | Results | 95% confidence interval |
| **Sensitivity** | 51.6 % | 39.2 % – 64.1 % | 70.0 % | 41.6 % – 98.4 % |
| **Specificity** | 93.0 % | 89.8 % – 96.3 % | 97.2 % | 93.3 % – 100.0 % |
| **PPV** | 66.7 % | 53.3 % – 80.0 % | 77.8 % | 50.6 % – 100.0 % |
| **NPV** | 87.7 % | 83.6 % – 91.8 % | 95.8 % | 91.2 % – 100.0 % |
| **ACC** | 84.2 % | 80.1 % – 88.4 % | 93.8 % | 88.6 % – 99.1 % |
| **AUC** | 0.723 | 0.642 – 0.805 | 0.836 | 0.662 – 1.000 |
| **DOR** | 14.3 | 7.0 – 29.1 | 80.5 | 11.4 – 566.3 |
| | Adenosquamous carcinoma (N = 8) | | Other (N = 9) | |
| | Results | 95% confidence interval | Results | 95% confidence interval |
| **Sensitivity** | 50.0 % | 0.0 % – 100.0 % | 0.0 % | 0.0 % – 0.0 % |
| **Specificity** | 83.3 % | 53.5 % – 100.0 % | 100.0 % | 100.0 % – 100.0 % |
| **PPV** | 50.0 % | 0.0 % – 100.0 % | x | x |
| **NPV** | 83.3 % | 53.5 % – 100.0 % | 88.9 % | 68.4 % – 100.0 % |
| **ACC** | 75.0 % | 45.0 % – 100.0 % | 88.9 % | 68.4 % – 100.0 % |
| **AUC** | 0.667 | 0.180 – 1.000 | 0.500 | 0.000 – 1.000 |
| **DOR** | 5.0 | 0.2 – 166.6 | x | x |

Comparison of sensitivity: p = 0.505, comparison of specificity: p = 0.340

Legend: PPV – positive predictive value, NPV – negative predictive value, ACC – accuracy, AUC – area under curve, DOR – diagnostic odds ratio

**Supplementary Table S3** Impact of lymphovascular space involvement (LVSI) on diagnostic performance of transrectal USG to assess pelvic lymph nodes

| Detection of pelvic node macrometastases and/or micrometastases (pN1) | | | | | | |
|---|---|---|---|---|---|---|
| | LVSI absent (N = 186) | | LVSI present (N = 184) | | LVSI unknown (N = 20) | |
| | Results | 95% CI | Results | 95% CI | Results | 95% CI |
| **Sensitivity** | 60.0 % | 17.1 % – 100.0 % | 49.2 % | 36.6 % – 61.7 % | 77.8 % | 50.6 % – 100.0 % |
| **Specificity** | 97.2 % | 94.8 % – 99.6 % | 93.5 % | 89.1 % – 97.9 % | 45.5 % | 16.0 % – 74.9 % |
| **PPV** | 37.5 % | 4.0 % – 71.0 % | 78.9 % | 66.0 % – 91.9 % | 53.8 % | 26.7 % – 80.9 % |
| **NPV** | 98.9 % | 97.3 % – 100.0 % | 78.8 % | 72.1 % – 85.4 % | 71.4 % | 38.0 % – 100.0 % |
| **ACC** | 96.2 % | 93.5 % – 99.0 % | 78.8 % | 72.9 % – 84.7 % | 60.0 % | 38.5 % – 81.5 % |
| **AUC** | 0.786 | 0.520 – 1.000 | 0.713 | 0.627 – 0.800 | 0.616 | 0.365 – 0.868 |
| **DOR** | 52.8 | 7.2 – 389.3 | 13.9 | 5.8 – 33.4 | 2.9 | 0.4 – 20.9 |

Comparison for LVSI absent vs. present – sensitivity: p = 0.638; specificity: p = 0.114

Legend: PPV – positive predictive value, NPV – negative predictive value, ACC – accuracy, AUC – area under curve, DOR – diagnostic odds ratio, LVSI – lymphovascular space invasion, CI – confidence interval

**Supplmentary Table S4** Impact of primary tumor size on diagnostic performance of transrectal USG to assess pelvic lymph nodes

| Detection of pelvic node macrometastases and/or micrometastases (pN1) | | | | | | |
|---|---|---|---|---|---|---|
| | < 20 mm (N = 119) | | 20–39 mm (N = 160) | | ≥ 40 mm (N = 111) | |
| | Results | 95% CI | Results | 95% CI | Results | 95% CI |
| **Sensitivity** | 0.0 % | x | 25.0 % | 3.8 % – 46.2 % | 67.9 % | 55.4 % – 80.5 % |
| **Specificity** | 99.1 % | 97.4 % – 100.0 % | 96.5 % | 93.5 % – 99.5 % | 77.6 % | 66.9 % – 88.3 % |
| **PPV** | 0.0 % | x | 44.4 % | 12.0 % – 76.9 % | 73.5 % | 61.1 % – 85.8 % |
| **NPV** | 94.9 % | 91.0 % – 98.9 % | 92.1 % | 87.7 % – 96.4 % | 72.6 % | 61.5 % – 83.7 % |
| **ACC** | 94.1 % | 89.9 % – 98.3 % | 89.4 % | 84.6 % – 94.1 % | 73.0 % | 64.7 % – 81.2 % |
| **AUC** | 0.496 | 0.259 – 0.732 | 0.608 | 0.444 – 0.771 | 0.728 | 0.631 – 0.824 |
| **DOR** | x | x | 9.3 | 2.2 – 39.2 | 7.3 | 3.1 – 17.1 |

Overall comparison of sensitivity: $p < 0.001$, overall comparison of specificity: $p < 0.001$

Legend: PPV – positive predictive value, NPV – negative predictive value, ACC – accuracy, AUC – area under curve, DOR – diagnostic odds ratio, CI – confidence interval

**Supplementary Table S5** Impact of parametrial involvement on diagnostic performance of transrectal USG to assess pelvic lymph nodes

| Detection of pelvic node macrometastases and/or micrometastases (pN1) | | | | |
|---|---|---|---|---|
| | Parametria not involved (N = 311) | | Parametria involved (N = 79) | |
| | Results | 95% confidence interval | Results | 95% confidence interval |
| **Sensitivity** | 30.6 % | 15.5 % – 45.6 % | 74.4 % | 60.7 % – 88.1 % |
| **Specificity** | 97.5 % | 95.6 % – 99.3 % | 70.0 % | 55.8 % – 84.2 % |
| **PPV** | 61.1 % | 38.6 % – 83.6 % | 70.7 % | 56.8 % – 84.7 % |
| **NPV** | 91.5 % | 88.3 % – 94.7 % | 73.7 % | 59.7 % – 87.7 % |
| **ACC** | 89.7 % | 86.3 % – 93.1 % | 72.2 % | 62.3 % – 82.0 % |
| **AUC** | 0.640 | 0.530 – 0.750 | 0.722 | 0.607 – 0.837 |
| **DOR** | 16.8 | 6.0 – 47.3 | 6.8 | 2.5 – 18.2 |

Comparison of sensitivity: $p < 0.001$, comparison of specificity: $p < 0.001$

Legend: PPV – positive predictive value, NPV – negative predictive value, ACC – accuracy, AUC – area under curve, DOR – diagnostic odds ratio

**Supplementary Table S6** Impact of certainty of USG assessment on its diagnostic performance to evaluate pelvic lymph nodes

| Detection of pelvic node macrometastases and/or micrometastases (pN1) | | | | |
|---|---|---|---|---|
| | US certainly or probably infiltrated as predictor of pN1 (N = 390) | | US only certainly infiltrated as predictor of pN1 (N = 390) | |
| | Results | 95% CI | Results | 95% CI |
| **Sensitivity** | 53.3 % | 42.0 % – 64.6 % | 41.3 % | 30.2 % – 52.5 % |
| **Specificity** | 94.0 % | 91.3 % – 96.6 % | 97.5 % | 95.7 % – 99.2 % |
| **PPV** | 67.8 % | 55.9 % – 79.7 % | 79.5 % | 66.8 % – 92.2 % |
| **NPV** | 89.4 % | 86.1 % – 92.7 % | 87.5 % | 84.0 % – 90.9 % |
| **ACC** | 86.2 % | 82.7 % – 89.6 % | 86.7 % | 83.3 % – 90.0 % |
| **AUC** | 0.737 | 0.663 – 0.810 | 0.694 | 0.617 – 0.771 |
| **DOR** | 17.8 | 9.3 – 34.1 | 27.0 | 11.7 – 62.6 |

Comparison of sensitivity: p = 0.008, comparison of specificity: p = 0.003

Legend: PPV – positive predictive value, NPV – negative predictive value, ACC – accuracy, AUC – area under curve, DOR – diagnostic odds ratio, CI – confidence interval

**Supplementary Table S7** Diagnostic performance of transrectal vs. transabdominal USG to detect node macrometastases in pelvic vs. para-aortic region

| Detection of pelvic and paraaortic node macrometastases | | | | |
|---|---|---|---|---|
| | Pelvic lymph nodes (N = 71) | | Paraaortic lymph nodes (N = 71) | |
| | Results | 95% confidence interval | Results | 95% confidence interval |
| **Sensitivity** | 80.0 % | 67.6 % – 92.4 % | 56.3 % | 31.9 % – 80.6 % |
| **Specificity** | 64.5 % | 47.7 % – 81.4 % | 98.2 % | 94.7 % – 100.0 % |
| **PPV** | 74.4 % | 61.4 % – 87.5 % | 90.0 % | 71.4 % – 100.0 % |
| **NPV** | 71.4 % | 54.7 % – 88.2 % | 88.5 % | 80.5 % – 96.5 % |
| **ACC** | 73.2 % | 62.9 % – 83.5 % | 88.7 % | 81.4 % – 96.1 % |
| **AUC** | 0.723 | 0.599 – 0.846 | 0.772 | 0.614 – 0.930 |
| **DOR** | 7.3 | 2.5 – 21.2 | 69.4 | 7.6 – 633.5 |

Comparison of sensitivity: $p = 0.070$, comparison of specificity: $p < 0.001$

Legend: PPV – positive predictive value, NPV – negative predictive value, ACC – accuracy, AUC – area under curve, DOR – diagnostic odds ratio

**Supplementary Video 1** Clip demonstrates the typical USG features of infiltrated pelvic lymph node in 2D gray scale and Doppler imaging in patient with squamous cell cervical carcinoma T1b2 (largest diameter of primary tumor 26 mm). It is a non-bulky lymph node (<15 mm) localized in left obturator fossa with low volume macrometastasis (4.5 mm) preoperatively detected by USG and verified by SLN biopsy with ultrastaging.


metaLN.mp4