This supplementary material has been provided by the authors to give readers additional information about their work.

## List of materials

***Supplementary S1.*** *Literature Search Strategy*

**Search strategy - Total results: 297.**

Search date: 20th January 2024

Last update: 7th April 2024

**PubMed:** ("HUGOTM"[All Fields] OR "HUGO"[All Fields] OR "HUGO RAS"[All Fields] OR "HUGO TM"[All Fields]) AND ("robotic-assisted"[All Fields] OR "prostatectomy"[All Fields] OR "radical prostatectomy"[All Fields] OR "robot-assisted radical prostatectomy"[All Fields] OR "robotic surgery"[All Fields] OR "robotic"[All Fields] OR "urologic"[All Fields] OR "RARP"[All Fields]) - Results: 66

**Web of Science:** (TS=("HUGOTM") OR TS=("HUGO") OR TS=("HUGO RAS") OR TS=("HUGO TM")) AND (TS=("robotic-assisted") OR TS=("prostatectomy") OR TS=("radical prostatectomy") OR TS=("robot-assisted radical prostatectomy") OR TS=("robotic surgery") OR TS=("robotic") OR TS=("urologic") OR TS=("RARP")) - Results: 60

**Scopus:** (TITLE-ABS-KEY ("HUGOTM") OR TITLE-ABS-KEY ("HUGO") OR TITLE-ABS-KEY ("HUGO RAS") OR TITLE-ABS-KEY ("HUGO TM")) AND (TITLE-ABS-KEY ("robotic-assisted") OR TITLE-ABS-KEY ("prostatectomy") OR TITLE-ABS-KEY ("radical prostatectomy") OR TITLE-ABS-KEY ("robot-assisted radical prostatectomy") OR TITLE-ABS-KEY ("robotic surgery") OR TITLE-ABS-KEY ("robotic") OR TITLE-ABS-KEY ("urologic") OR TITLE-ABS-KEY ("RARP"))- Results: 72

**Embase:** ('HUGOTM':ab,ti OR 'HUGO':ab,ti OR 'HUGO RAS':ab,ti OR 'HUGO TM':ab,ti) AND ('robotic assisted':ab,ti OR 'prostatectomy'/exp OR 'radical prostatectomy':ab,ti OR 'robotic assisted radical prostatectomy':ab,ti OR 'robotic surgery':ab,ti OR 'robotic':ab,ti OR 'urologic':ab,ti OR 'RARP':ab,ti) - Results: 99

| ***Supplementary Table S1.*** *PICOS criteria* | |
|---|---|
| Population | Adult males (aged ≥ 18 years) diagnosed with prostate cancer amenable to local treatment |
| Intervention | Transperitoneal robot-assisted radical prostatectomy performed with the Hugo™ RAS System |
| Comparison | A comparator was not required |
| Outcomes | Surgical, oncological, and functional outcomes |
| Study design | Randomized controlled trials, prospective and retrospective case series |

| ***Supplementary Table S2.*** *Exclusion following full-text review* | | |
|---|---|---|
| **Title** | **Author** | **Exclusion criteria** |
| Robot-assisted Radical Prostatectomy with the Novel Hugo Robotic System: Initial Experience and Optimal Surgical Set-up at a Tertiary Referral Robotic Center | Bravi CA | Published update |
| Robot-assisted radical prostatectomy feasibility and setting with the Hugo™ robot-assisted surgery system | Sarchi L | RARP on cadavers |
| HUGO(TM) RAS System in Robotic-Assisted Radical prostatectomy is highligheted in International Brazilian Journal of Urology | Favorito AL | Editorial |
| Nerve-sparing robot-assisted radical prostatectomy with the HUGO™ robot-assisted surgery system using the 'Aalst technique' | Paciotti M | Published update |
| Outcomes of Robot-assisted Radical Prostatectomy with the Hugo RAS Surgical System: Initial Experience at a High-volume Robotic Center | Bravi CA [29] | Published update (it has been considered for additional data regarding post-operative PSA and console time) |
| The new surgical robotic platform HUGOTM RAS: System description and docking settings for robot-assisted radical prostatectomy | Totaro A [30] | Published update (it has been considered for additional data regarding tilt and docking angles) |
| State of the Art in Robotic Surgery with Hugo RAS System: Feasibility, Safety and Clinical Applications | Prata F | Review |
| Robotic Surgery in Urology: History from PROBOT® to HUGOTM | Brassetti A | Review |
| Technology description, initial experience and first impression of HUGO™ RAS robot platform in urologic procedures in Brazil | Carneiro A | No RARP data |
| Extraperitoneal robot-assisted radical prostatectomy with the Hugo™ RAS system: initial experience of a tertiary center with a high background in extraperitoneal laparoscopy surgery | Marques-Monteiro M | Extraperitoneal RARP |
| Evaluation of Hugo RAS System in Major Urologic Surgery: Our Initial Experience | Ragavan N [31] | Published update (it has been considered for additional data regarding tilt and docking angles) |
| Current urological applications of the Hugo™ RAS | Soputro NA | Review |

| | | |
|---|---|---|
| system | | |
| Multimodular robotic systems (Hugo RAS and Versius CMR) for pelvic surgery: tasks and perspectives from the bed-side assistant | Sighinolfi MC | No RARP data |
| Experiences with and Expectations of Robotic Surgical Systems: A Rapid Qualitative Review [Internet] | Martinello N | Review |
| New multiport robotic surgical systems: a comprehensive literature review of clinical outcomes in urology | Salkowski M | Review |
| New robotic platforms for prostate surgery: the future is now | Mjaess G | Review |
| Comparison of outcomes of multiple platforms for assisted robotic-prostatectomy: rationale and design | Veccia A | Letter to editor |
| Video comparison of HUGO-RAS vs. daVinci techniques in robotic radical prostatectomy: Providing insights from our preliminary study results | Brime Menendez R | Multimedia abstract |
| STEP-BY-STEP DESCRIPTION OF ROBOT-ASSISTED RADICAL PROSTATECTOMY WITH THE NOVEL HUGO RAS ROBOTIC SYSTEM USING THE AALST TECHNIQUE | Paciotti M | Abstract with data published in subsequent paper |
| A SYNOPTIC JOURNEY IN ROBOTIC ASSISTED RADICAL PROSTATECTOMY WITH THREE DIFFERENT PLATFORMS: CLINICAL CASES BY A SINGLE SURGEON WITH THE DA VINCI, HUGO TM RAS AND VERSIUS SURGICAL SYSTEMS | Rocco BM | Abstract with no data available |
| SURGICAL OUTCOMES OF ROBOT-ASSISTED RADICAL PROSTATECTOMY WITH THE NOVEL HUGO ROBOTIC SYSTEM: INITIAL 100 CASES PERFORMED AT A TERTIARY REFERRAL ROBOTIC CENTER CENTER | Paciotti M | Abstract with data published in subsequent paper |
| Retzius-sparing radical prostatectomy performed with HugoTM RAS surgical system: Initial experience from a referral center | Dell'Oglio P | Case report |
| Implementation of HUGO Ras system in robotic-assisted radical prostatectomy | Alfano CG | Abstract with data published in subsequent study |
| Outcomes of Robotic-Assisted Radical Prostatectomy with Hugo RAS System: Initial Experience in Japan | Tbata K | Undivided data involving intraperitoneal and extraperitoneal RARP |

| | | |
|---|---|---|
| Surgical setting and perioperative outcomes of robot-assisted radical prostatectomy with the novel “hugo” robotic system: initial experience at a tertiary referral robotic center | Paciotti M | Abstract with data published in subsequent study |
| Robot-assisted radical prostatectomy using hugo RAS system: the pioneer experience in Taiwan and Northeast Asia | Ou YC [32] | Published update (it has been considered for additional data regarding tilt and docking angles) |
| Mirrored port placement for robotic radical prostatectomy with the Hugo RAS™ System: initial experience | Veccia A/Antonelli A [33] | Published update (it has been considered for additional data regarding tilt and docking angles) |

***Supplementary Table S3.*** *Focus on ISUP grade group at the preoperative prostate biopsy.*

| **Author, Year** | **Country** | **Number of patients N** | **ISUP 1 at biopsy N (%)** | **ISUP 2 at biopsy N (%)** | **ISUP 3 at biopsy N (%)** | **ISUP 4 at biopsy N (%)** | **ISUP 5 at biopsy N (%)** |
|---|---|---|---|---|---|---|---|
| Totaro et al., 2024 [22] | Italy | 132 | 43 (32.6) | 48 (36.4) | 19 (14.4) | 14 (10.5) | 8 (6.1) |
| Alfano et al., 2023 [3] | Panama | 15 | 7 (47) | 6 (40) | 0 (0) | 2 (13) | 0 (0) |
| Ragavan et al., 2023 [25] | India | 17 | NR | NR | NR | NR | NR |
| Ou et al., 2024 [26] | Taiwan | 30 | 17 (56.7) | 6 (20) | 3 (10) | 3 (10) | 1 (3.3) |
| Bravi et al., 2023 [23] | Belgium | 164 | 53 (32) | 58 (35) | 41 (25) | 10 (6) | 2 (2) |
| Olsen et al., 2023 [24] | Denmark | 19 | NR | NR | NR | NR | NR |
| Territo et al., 2023 [27] | Spain | 17 | NR | NR | NR | NR | NR |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Tedesco et al., 2023 [19] | Italy | 30 | NR | NR | NR | NR | NR |
| Ng et al., 2023 [20] | Hong Kong | 10 | NR | NR | NR | NR | NR |
| Jaffer et al., 2023 [21] | England | 20 | NR | NR | NR | NR | NR |
| Brime Menendez et al., 2024 [18] | Spain | 75 | 23 (30.8) | 26 (34.7) | 19 (25.3) | 7 (9.2) | 0 (0) |
| Antonelli et al., 2024 [28] | Italy | 50 | 9 (18) | 18 (36) | 14 (28) | 9 (18) | 0 (0) |

*ISUP, International Society of Urological Pathology; NR, Not Reported.*

**Supplementary Table S4.** Docking arms and patient positioning during RARP

| Author, Year | Country | Patient position | Endoscope cart position | Endoscope: Tilt angle – Docking angle (° / °) | Right arm: Tilt angle – Docking angle (° / °) | Left arm: Tilt angle – Docking angle (° / °) | Fourth arm: Tilt angle – Docking angle (° / °) |
|---|---|---|---|---|---|---|---|
| Totaro et al., 2024 [22, 30] | Italy | Lithotomy 0° supine Trendelenburg | Between legs | -45 / 175 | -40 / 225 | -40 / 140 | 30 / 105 |
| Alfano et al., 2023 [3] | Panama | Lithotomy | Between legs | -45 / 185 | -30 / 230 | -30 / 140 | 15 / 105 |
| Ragavan et al., 2023 [25, 31] | India | Low lithotomy Less than 30° Trendelenburg | Betweem legs | -45 / 185 | -30 / 230 | -30 /140 | 15 / 255 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Ou et al., 2023 [26,32] | Taiwan | 25° Head-down Trendelenburg | Left side | -45 / 175 | -30 / 220 | -30 / 140 | 15 / 105 |
| Bravi et al., 2023 [23] | Belgium | Lithotomy 0° supine Trendelenburg | Left side | -45 / 175 | -30 / 220 | -30 / 140 | 30 / 105 |
| Olsen et al., 2023 [24] | Denmark | NR | NR | NR | NR | NR | NR |
| Territo et al., 2023 [27] | Spain | 30° Trendelenburg 30° legs abducted Supine | NR | -45 / 175 | -30 / 225 | -30 / 140 | 30 / 105 |
| Tedesco et al., 2023 [19] | Italy | NR | NR | -45 / 175 | -40 / 225 | -40 / 140 | *3 cart arm used |
| Ng et al., 2023 [20] | Hong Kong | NR | NR | NR | NR | NR | NR |
| Jaffer et al., 2023 [21] | England | NR | NR | NR | NR | NR | NR |
| Brime Menendez et al., 2024 [22] | Spain | NR | NR | NR | NR | NR | NR |
| Veccia /Antonelli et al., 2024 [28,33] (Standard setting: bed assistant on the right) | Italy | Lithotomy Legs joined and extended 25° Trendelenburg | Left side | -45 / 175 ± 5 | - 45 / 220 ± 5 | -30 / 140 ± 5 | 30 /105 ± 5 |
| Veccia /Antonelli et al., 2024 [28,33] (Mirrored setting: bed assistant on the left) | | | Right side | -45 / 185 ± 5 | - 30 / 220 ± 5 | -30 / 140 ± 5 | 30 /255 ± 5 |

*NR, Not Reported.*

**Supplementary Table S5.** Results of meta-regression analysis

| ***Estimated blood of loss (ml) [3, 18, 21-24, 26, 27]*** | | | |
|---|---|---|---|
| Variables | Beta | 95% CI | P-value |
| Age | 4.908 | -30.393, 40.209 | 0.785 |
| Sample size | 0.634 | -0.817, 2.084 | 0.392 |
| Study design<br>Prospective<br>Retrospective | <br>ref<br>60.229 | <br><br>-108.457, 228.915 | <br><br>0.484 |
| $R^2$ for the model | 0.00% | | |
| | | | |
| ***Length of stay (days) [3, 19, 21-27]*** | | | |
| Variables | Beta | 95% CI | P-value |
| Age | 0.282 | -0.326, 0.890 | 0.363 |
| Sample size | 0.010 | -0.015, 0.034 | 0.440 |
| Study design<br>Prospective<br>Retrospective | <br>ref<br>1.453 | <br><br>-0.788, 4.525 | <br><br>0.354 |
| $R^2$ for the model | 0.0% | | |
| | | | |
| ***Clavien-Dindo ≥2 complications [3, 18, 21-25, 27]*** | | | |

| Variables | OR | 95% CI | P-value |
|---|---|---|---|
| Age | 0.959 | 0.920, 0.999 | **0.045** |
| Sample size | 1.000 | 0.998, 1.001 | 0.435 |
| Study design | | | |
| Prospective | ref | | |
| Retrospective | 1.085 | 0.934, 1.262 | 0.287 |
| $R^2$ for the model | 64.78% | | |

***Supplementary Table S6.*** *Focus on tumor and node stage at the final histopathology.*

| Author, Year | Country | Number of patients N | T1 stage at pathology N (%) | T2 stage at pathology N (%) | T3 stage at pathology N (%) | T4 stage at pathology N (%) | Nx stage at pathology N (%) | N0 stage at pathology N (%) | N1 stage at pathology N (%) | N2 stage at pathology N (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| Totaro et al., 2024 [22] | Italy | 132 | 2 (1.5) | 94 (72.3) | 34 (26.2) | 0 (0) | 107 (81.1) | 20 (15.5) | 5 (3.8) | 0 (0) |
| Alfano et al., 2023 [3] | Panama | 15 | 0 (0) | 11 (73.3) | 4 (26.7) | 0 (0) | NR | NR | NR | NR |
| Ragavan et al., 2023 [25] | India | 17 | NR | NR | NR | NR | NR | NR | NR | NR |
| Ou et al., 2024 [26] | Taiwan | 30 | 0 (0) | 24 (80) | 3 (10) | 0 (0) | NR | NR | NR | NR |
| Bravi et al., 2023 [23] | Belgium | 164 | 0 (0) | 110 (67) | 54 (33) | 0 (0) | 123 (74.7) | 34 (21) | 7 (4.3) | 0 (0) |
| Olsen et al., 2023 [24] | Denmark | 19 | 0 (0) | 11 (57.9) | 8 (42.1) | 0 (0) | NR | NR | NR | NR |
| Territo et al., 2023 [27] | Spain | 17 | 0 (0) | 14 (82.4) | 3 (17.6) | 0 (0) | NR | NR | NR | NR |
| Tedesco et al., 2023 [19] | Italy | 30 | NR | NR | NR | NR | NR | NR | NR | NR |
| Ng et al., 2023 [20] | Hong Kong | 10 | NR | NR | NR | NR | NR | NR | NR | NR |
| Jaffer et al., 2023 [21] | England | 20 | 0 (0) | 10 (50) | 10 (50) | 0 (0) | NR | NR | NR | NR |
| Brime Menendez et al., 2024 [18] | Spain | 75 | 0 (0) | 55 (73.3) | 20 (26.7) | 0 (0) | 53 (70.7) | 16 (21.3) | 6 (8) | 0 (0) |

*NR, Not Reported.*

***Supplementary Table S7.*** *Focus on ISUP grade group at the final histopathology.*

| Author, Year | Country | Number of patients N | ISUP 1 at pathology N (%) | ISUP 2 at pathology N (%) | ISUP 3 at pathology N (%) | ISUP 4 at pathology N (%) | ISUP 5 at pathology N (%) |
|---|---|---|---|---|---|---|---|
| Totaro et al., 2024 [22] | Italy | 132 | 20 (15.5) | 76 (58.9) | 30 (23.3) | 1 (0.8) | 2 (1.5) |
| Alfano et al., 2023 [3] | Panama | 15 | 2 (13.3) | 11 (73.3) | 1 (6.7) | 0 (0) | 1 (6.7) |
| Ragavan et al., 2023 [25] | India | 17 | NR | NR | NR | NR | NR |
| Ou et al., 2023 [32] | Taiwan | 12 | 0 (0) | 3 (25) | 5 (42) | 0 (0) | 4 (33) |
| Bravi et al., 2023 [23] | Belgium | 164 | 19 (12) | 83 (51) | 48 (29) | 10 (6) | 4 (2) |
| Olsen et al., 2023 [24] | Denmark | 19 | NR | NR | NR | NR | NR |
| Territo et al., 2023 [27] | Spain | 17 | 1 (5.9) | 9 (52.9) | 5 (29.4) | 0 (0) | 2 (11.8) |
| Tedesco et al., 2023 [19] | Italy | 30 | NR | NR | NR | NR | NR |
| Ng et al., 2023 [20] | Hong Kong | 10 | NR | NR | NR | NR | NR |
| Jaffer et al., 2023 [21] | England | 20 | 0 (0) | 10 (50) | 10 (50) | 0 (0) | 0 (0) |
| Brime Menendez et al., 2024 [18] | Spain | 75 | 30 (40) | 21 (28) | 19 (25.3) | 4 (5.3) | 1 (1.4) |

*ISUP, International Society of Urological Pathology; NR, Not Reported.*

| ***Supplementary Table S8.*** *Results of the sensitivity analysis.* | | | | | |
|---|---|---|---|---|---|
| ***Docking time (min)*** | | | | | |
| Studies | Effect size | 95% CI | P-value | Heterogeneity | Het. P-value |
| Alfano et al., 2023 [3] | 11.69 | 8.15, 15.22 | <0.001 | 98.6% | <0.001 |
| Antonelli et.al., 2024 [28] | 11.28 | 7.58, 14.98 | <0.001 | 98.7% | <0.001 |
| Brime Menendez et al., 2023 [18] | 10.34 | 7.25, 13.42 | <0.001 | 98.1% | <0.001 |
| Jaffer et al., 2023 [21] | 11.95 | 8.63, 15.26 | <0.001 | 97.7% | <0.001 |
| Olsen et al., 2023 [24] | 11.61 | 8.00, 15.21 | <0.001 | 98.7% | <0.001 |
| Ou et al., 2024 [26] | 10.04 | 7.50, 12.58 | <0.001 | 97.4% | <0.001 |
| Ragavan et al., 2023 [25] | 11.39 | 7.70, 15.08 | <0.001 | 98.4% | <0.001 |
| Tedesco et al., 2023 [19] | 11.50 | 7.85, 15.16 | <0.001 | 98.7% | <0.001 |
| Territo et al., 2023 [27] | 11.17 | 7.52, 14.82 | <0.001 | 98.8% | <0.001 |
| Totaro et al., 2024 [22] | 11.39 | 7.70, 15.09 | <0.001 | 98.1% | <0.001 |
| All studies | 11.23 | 7.95, 14.50 | <0.001 | 98.4% | <0.001 |
| | | | | | |
| ***Console time (min)*** | | | | | |
| Studies | Effect size | 95% CI | P-value | Heterogeneity | Het. P-value |
| Bravi et al., 2023 [23] | 140.89 | 114.43, 167.35 | <0.001 | 97.0% | <0.001 |

| | | | | | |
|---|---|---|---|---|---|
| Jaffer et al., 2023 [21] | 144.28 | 118.07, 170.49 | <0.001 | 96.8% | <0.001 |
| Olsen et al., 2023 [24] | 149.65 | 129.43, 169.87 | <0.001 | 95.2% | <0.001 |
| Ou et al., 2024 [26] | 141.49 | 114.95, 168.04 | <0.001 | 97.1% | <0.001 |
| Ragavan et al., 2023 [25] | 137.92 | 113.53, 162.31 | <0.001 | 96.9% | <0.001 |
| Territo et al., 2023 [27] | 134.67 | 114.46, 154.87 | <0.001 | 93.5% | <0.001 |
| Totaro et al., 2024 [22] | 146.42 | 121.69, 171.15 | <0.001 | 96.7% | <0.001 |
| All studies | 142.21 | 119.74, 164.68 | <0.001 | 96.5% | <0.001 |
| | | | | | |
| ***Operative time (min)*** | | | | | |
| Studies | Effect size | 95% CI | P-value | Heterogeneity | Het. P-value |
| Alfano et al., 2023 [3] | 166.72 | 142.19, 191.25 | <0.001 | 95.1% | <0.001 |
| Bravi et al., 2023 [23] | 175.56 | 142.46, 208.66 | <0.001 | 95.5% | <0.001 |
| Brime Menendez et al., 2023 [18] | 182.60 | 153.10, 212.09 | <0.001 | 95.2% | <0.001 |
| Ng et al., 2023 [20] | 175.30 | 142.82, 207.79 | <0.001 | 97.2% | <0.001 |
| Ragavan et al., 2023 [25] | 173.22 | 141.46, 204.99 | <0.001 | 97.1% | <0.001 |
| Tedesco et al., 2023 [19] | 185.10 | 160.51, 209.69 | <0.001 | 94.5% | <0.001 |
| Totaro et al., 2024 [22] | 173.98 | 141.39, 206.57 | <0.001 | 96.5% | <0.001 |
| All studies | 176.04 | 148.33, 203.76 | <0.001 | 96.3% | <0.001 |

| | | | | | |
|---|---|---|---|---|---|
| ***Number of nodes removed*** | | | | | |
| Studies | Effect size | 95% CI | P-value | Heterogeneity | Het. P-value |
| Bravi et al., 2023 [23] | 9.85 | 6.58, 13.12 | <0.001 | 95.8% | <0.001 |
| Brime Menendez et al., 2023 [18] | 9.66 | 6.75, 12.58 | <0.001 | 94.0% | <0.001 |
| Ou et al., 2024 [26] | 11.34 | 7.87, 14.81 | <0.001 | 97.0% | <0.001 |
| Ragavan et al., 2023 [25] | 11.23 | 7.62, 14.83 | <0.001 | 97.0% | <0.001 |
| Totaro et al., 2024 [22] | 11.35 | 7.88, 14.81 | <0.001 | 96.9% | <0.001 |
| All studies | 10.69 | 7.69, 13.69 | <0.001 | 96.4% | <0.001 |
| | | | | | |
| ***Estimated blood loss (ml)*** | | | | | |
| Studies | Effect size | 95% CI | P-value | Heterogeneity | Het. P-value |
| Alfano et al., 2023 [3] | 216.70 | 156.54, 276.85 | <0.001 | 98.8% | <0.001 |
| Antonelli et.al., 2024 [28] | 216.11 | 155.86, 276.36 | <0.001 | 98.8% | <0.001 |
| Bravi et al., 2023 [23] | 203.06 | 155.12, 251.01 | <0.001 | 98.0% | <0.001 |
| Brime Menendez et al., 2023 [18] | 220.69 | 158.06, 283.32 | <0.001 | 97.2% | <0.001 |
| Jaffer et al., 2023 [21] | 236.57 | 180.03, 293.10 | <0.001 | 98.1% | <0.001 |
| Ng et al., 2023 [20] | 226.21 | 163.54, 288.88 | <0.001 | 98.8% | <0.001 |

| | | | | | |
|---|---|---|---|---|---|
| Olsen et al., 2023 [24] | 217.24 | 157.20, 277.27 | <0.001 | 98.8% | <0.001 |
| Ou et al., 2024 [26] | 227.06 | 165.21, 288.92 | <0.001 | 98.9% | <0.001 |
| Tedesco et al., 2023 [19] | 230.98 | 170.25, 291.72 | <0.001 | 98.8% | <0.001 |
| Territo et al., 2023 [27] | 226.13 | 163.61, 288.66 | <0.001 | 98.9% | <0.001 |
| Totaro et al., 2024 [22] | 236.60 | 180.08, 293.11 | <0.001 | 97.9% | <0.001 |
| All studies | 223.46 | 166.75, 280.17 | <0.001 | 98.7% | <0.001 |
| | | | | | |
| ***Length of stay (days)*** | | | | | |
| Studies | Effect size | 95% CI | P-value | Heterogeneity | Het. P-value |
| Alfano et al., 2023 [3] | 2.86 | 1.64, 4.09 | <0.001 | 99.9% | <0.001 |
| Bravi et al., 2023 [23] | 2.75 | 1.51, 3.99 | <0.001 | 100.0% | <0.001 |
| Brime Menendez et al., 2024 [18] | 2.84 | 1.60, 4.07 | <0.001 | 100.0% | <0.001 |
| Jaffer et al., 2023 [21] | 2.92 | 1.72, 4.12 | <0.001 | 100.0% | <0.001 |
| Ng et al., 2023 [20] | 2.75 | 1.51, 3.99 | <0.001 | 100.0% | <0.001 |
| Olsen et al., 2023 [24] | 2.98 | 1.81, 4.14 | <0.001 | 99.9% | <0.001 |
| Ou et al., 2024 [26] | 2.29 | 1.61, 2.97 | <0.001 | 99.9% | <0.001 |
| Ragavan et al., 2023 [25] | 2.97 | 1.81, 4.13 | <0.001 | 100.0% | <0.001 |
| Territo et al., 2023 [27] | 2.75 | 1.52, 3.98 | <0.001 | 100.0% | <0.001 |

| | | | | | |
|---|---|---|---|---|---|
| Totaro et al., 2024 [22] | 2.64 | 1.43, 3.84 | <0.001 | 100.0% | <0.001 |
| All studies | 2.78 | 1.67, 3.89 | <0.001 | 100.0% | <0.001 |
| | | | | | |
| ***Time to catheter removal (days)*** | | | | | |
| Studies | Effect size | 95% CI | P-value | Heterogeneity | Het. P-value |
| Alfano et al., 2023 [3] | 8.52 | 5.32, 11.71 | <0.001 | 100.0% | <0.001 |
| Bravi et al., 2023 [23] | 9.23 | 6.78, 11.68 | <0.001 | 99.9% | <0.001 |
| Brime Menendez et al., 2023 [18] | 7.85 | 4.81, 10.89 | <0.001 | 100.0% | <0.001 |
| Jaffer et al., 2023 [21] | 8.04 | 5.02, 11.07 | <0.001 | 100.0% | <0.001 |
| Ng et al., 2023 [20] | 8.52 | 5.32, 11.71 | <0.001 | 100.0% | <0.001 |
| Ou et al., 2024 [26] | 8.51 | 5.32, 11.70 | <0.001 | 100.0% | <0.001 |
| Ragavan et al., 2023 [25] | 8.52 | 5.32, 11.71 | <0.001 | 100.0% | <0.001 |
| Totaro et al., 2024 [22] | 7.25 | 4.96, 9.54 | <0.001 | 100.0% | <0.001 |
| All studies | 8.31 | 5.53, 11.09 | <0.001 | 100.0% | <0.001 |
| | | | | | |
| ***Positive surgical margins rate*** | | | | | |
| Studies | Effect size | 95% CI | P-value | Heterogeneity | Het. P-value |
| Alfano et al., 2023 [3] | 0.191 | 0.115, 0.278 | <0.001 | 73.4% | <0.001 |

| | | | | | |
|---|---|---|---|---|---|
| Bravi et al., 2023 [23] | 0.219 | 0.139, 0.309 | <0.001 | 61.3% | 0.012 |
| Brime Menendez et al., 2023 [18] | 0.202 | 0.115, 0.304 | <0.001 | 75.1% | <0.001 |
| Jaffer et al., 2023 [21] | 0.227 | 0.158, 0.303 | <0.001 | 60.1% | 0.014 |
| Olsen et al., 2023 [24] | 0.186 | 0.112, 0.271 | <0.001 | 71.9% | 0.001 |
| Ou et al., 2024 [26] | 0.201 | 0.119, 0.296 | <0.001 | 75.1% | <0.001 |
| Ragavan et al., 2023 [25] | 0.198 | 0.119, 0.289 | <0.001 | 74.8% | <0.001 |
| Territo et al., 2023 [27] | 0.193 | 0.116, 0.282 | <0.001 | 74.1% | <0.001 |
| Totaro et al., 2024 [22] | 0.187 | 0.108, 0.279 | <0.001 | 66.7% | 0.004 |
| All studies | 0.200 | 0.126, 0.285 | <0.001 | 71.5% | <0.001 |
| | | | | | |
| ***Undetectable PSA rate at first follow-up after surgery*** | | | | | |
| Studies | Effect size | 95% CI | P-value | Heterogeneity | Het. P-value |
| Alfano et al., 2023 [3] | 0.922 | 0.847, 0.974 | <0.001 | 60.8% | 0.110 |
| Bravi et al., 2023 [23] | 0.946 | 0.922, 0.993 | <0.001 | 0.0% | 0.340 |
| Totaro et al., 2024 [22] | 0.945 | 0.789, 1.000 | <0.001 | 63.3% | 0.099 |
| All studies | 0.942 | 0.877, 0.986 | <0.001 | 48.9% | 0.141 |
| | | | | | |
| ***Clavien-Dindo ≥2 complications rate*** | | | | | |

| Studies | Effect size | 95% CI | P-value | Heterogeneity | Het. P-value |
|---|---|---|---|---|---|
| Alfano et al., 2023 [3] | 0.040 | 0.008, 0.087 | <0.001 | 66.6% | 0.001 |
| Bravi et al., 2023 [23] | 0.041 | 0.006, 0.097 | <0.001 | 65.7% | 0.002 |
| Brime Menendez et al., 2023 [18] | 0.048 | 0.011, 0.100 | <0.001 | 64.2% | 0.003 |
| Jaffer et al., 2023 [21] | 0.026 | 0.005, 0.056 | <0.001 | 42.8% | 0.072 |
| Ng et al., 2023 [20] | 0.040 | 0.009, 0.085 | <0.001 | 65.9% | 0.002 |
| Olsen et al., 2023 [24] | 0.037 | 0.007, 0.082 | <0.001 | 65.2% | 0.002 |
| Ou et al., 2024 [26] | 0.048 | 0.013, 0.098 | <0.001 | 64.4% | 0.003 |
| Ragavan et al., 2023 [25] | 0.046 | 0.012, 0.095 | <0.001 | 66.3% | 0.002 |
| Tedesco et al., 2023 [19] | 0.048 | 0.013, 0.098 | <0.001 | 64.4% | 0.003 |
| Territo et al., 2023 [27] | 0.034 | 0.006, 0.075 | <0.001 | 61.5% | 0.005 |
| Totaro et al., 2024 [22] | 0.047 | 0.010, 0.103 | <0.001 | 64.2% | 0.003 |
| All studies | 0.041 | 0.010, 0.085 | <0.001 | 63.6% | 0.002 |
| | | | | | |
| ***Social continence rate at 3 months*** | | | | | |
| Studies | Effect size | 95% CI | P-value | Heterogeneity | Het. P-value |
| Bravi et al., 2023 [23] | 0.821 | 0.707, 0.913 | <0.001 | 72.3% | 0.003 |
| Brime Menendez et al., 2023 [18] | 0.803 | 0.708, 0.884 | <0.001 | 65.8% | 0.012 |

| | | | | | |
|---|---|---|---|---|---|
| Ng et al., 2023 [20] | 0.819 | 0.732, 0.893 | <0.001 | 72.3% | 0.003 |
| Olsen et al., 2023 [24] | 0.839 | 0.766, 0.902 | <0.001 | 61.6% | 0.023 |
| Ou et al., 2024 [26] | 0.827 | 0.735, 0.904 | <0.001 | 71.8% | 0.003 |
| Ragavan et al., 2023 [25] | 0.795 | 0.728, 0.854 | <0.001 | 48.4% | 0.084 |
| Totaro et al., 2024 [22] | 0.833 | 0.732, 0.916 | <0.001 | 68.0% | 0.008 |
| All studies | 0.819 | 0.738, 0.889 | <0.001 | 66.9% | 0.006 |

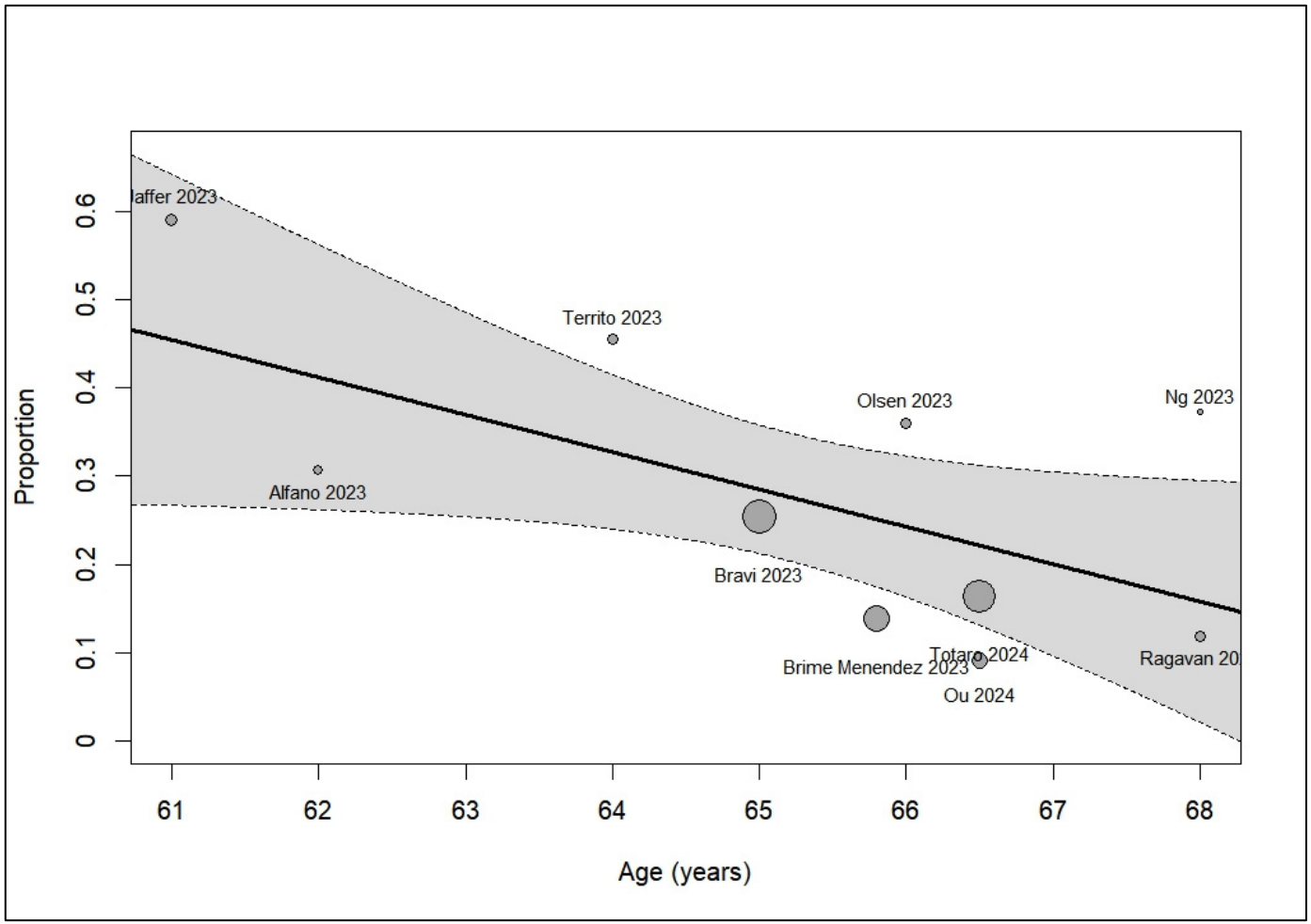
***Supplementary Table S9.*** *Comparison of technical insights between Hugo™ RAS and daVinci systems*

| | **daVinci Surgical System** | **HUGO™ RAS System** |
|---|---|---|
| Console [41,42] | <u>Closed console</u><br><br>Surgeon most deeply "immersed" during the procedure | <u>Open console</u><br><br>Improved surgeon awareness of the theatre<br>Multitasking |

| | | |
|---|---|---|
| | Less susceptibility to external distractions<br>Microphone system for communication<br>Needs to withdraw their focus to visually connect with the operating room. | Face-to-face communication – easier team communication (facilitating surgical training) [22,23,25,27]<br>External factors can disturb the surgeon's concentration |
| Seated position [41,42] | Constrained postures – no possibility to vary the working posture<br>The surgeon has to lean forward slightly to have a great view of the screen. | Move the head freely to adopt various working postures.<br>Better ergonomic position because it is possible to sit more comfortably. |
| Arm cart/system tower | <u>Individual arm cart</u><br>External range of motion is potentially facilitated without arm collisions [41]<br>Design of setup joints with limited freedom of movement is such so as to facilitate port placement [41]<br>Less spatial constraint in operating room [41]<br>Assistant surgeon and scrub nurse comfort is enhanced due to "spacious" table side by daVinci's smaller arms [28]<br>There are fewer cables on the operating room floor [41] | <u>Modular arm cart</u><br>Facilitates multi-quadrant surgery [27]<br>Provides a greater range of angle for docking<br>More challenging and time-consuming docking process [3,22,23,28]<br>More spatial constraint in operating room [25,26,27]<br>Assistant surgeon and scrub nurse discomfort is due to the "crowded" table side by HUGO RAS's larger arms [28]<br>There are more cables on the operating room floor [41] |
| | 3D HD vision system [44] | 3D HD vision system [43] |

| | | |
|---|---|---|
| Vision system | Stereoscopic technology – more realistic display [26] | Passive 3D display lag in realism [26]<br>Camera movement automatically follows the 3D glasses movement of the surgeon, facilitating a natural shift in task focus |
| Manual control | Pincer-grip master controller [44]<br>Endowrist instruments:<br>7° of freedom<br>90° of articulation<br>Intuitive motion and finger-tip control<br>Motion scaling and tremor filtration [44] | Pistol-grip controller [43]<br>Scaling factor for wrist rotation up to 2x and rotation range up to 520°[23]<br>Adjustable scaling for wrist rotation facilitates suture in deep cavities [27]<br>Tremor filtration [43] |
| Foot pedal array [41, 42] | Swap pedal instrument: one click is enough and the arm in use changes<br>The right foot controls the energy instruments, while the left foot activates the clutch and endoscope<br>A second optional console allows for tandem surgery and training | Swap pedal instrument.: it is necessary to keep it pressed for 1.5 seconds for the change occur<br>Monopolar and bipolar power activation: initially, press the pedal for 1.5 seconds, release it, and then activate it again<br>LigaSure pedals to the left of the bipolar pedal (given that 90% of surgeons are right-handed, it would be more intuitive for the LigaSure pedals to be positioned to the right of the bipolar pedal) |
| | Quick-release levers speed expedite instrument changes during surgery [44] | Disposable instruments [43]<br>Advanced energy, stapling devices, and clip appliers not available [41,42] |

| | | |
|---|---|---|
| Instruments | Force bipolar: DualGrip technology allows for adjustable grip strength (default or strong) via the foot pedal [44]<br>EndoWrist technology provides full wristed dexterity [44]<br>daVinci energy enables rapid sealing while maintaining low temperatures [44] | Lack of a robotic instrument for "gentle" grasping and traction [22]<br>Scissors may jump slightly upon closure, especially when used with active monopolar diathermy in a "cut-burn" technique [42]<br>Higher incidence of malfunctioning events (20 out of 50 procedures). Issues include platform battery supply alarm, system power failure, arm conflicts, scissors rupture, malfunctioning Maryland bipolar forceps, and failed fourth arm calibration [28] |
| Artificial Intelligence Tool | My Intuitive software [44] | Touch Surgery™ software: identifies and automatically segments steps of the procedure (streamlining teaching) [43] |




***Supplementary Figure S1.*** *Bubble plot of Clavien-Dindo ≥2 complications*