

Low Conversion Rates in Robotic-Assisted Colorectal Surgery: Risk Factors from a Multi-Platform Experience (**da Vinci Si/Xi** and the Japanese **hinotori™** Robotic System)



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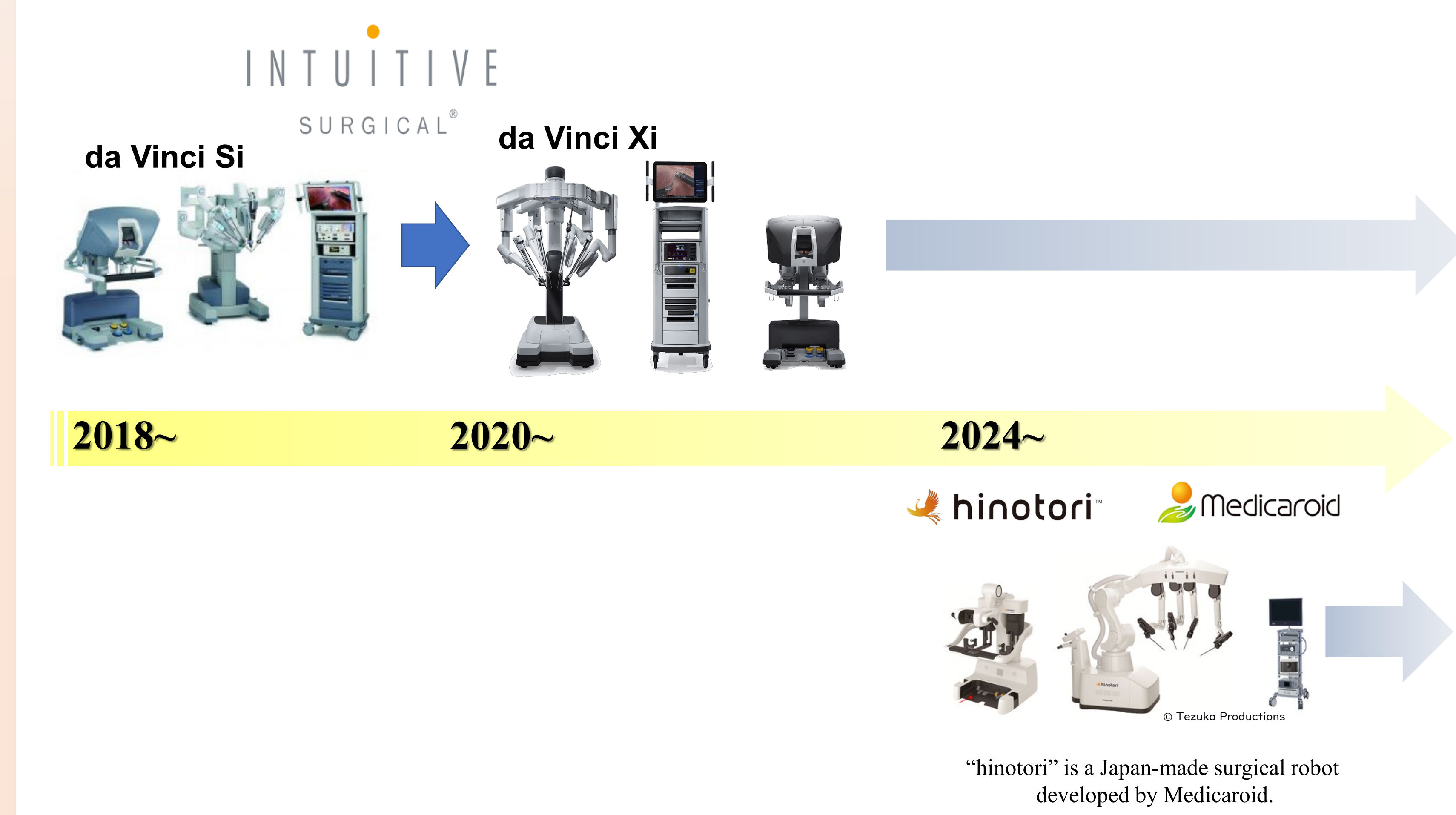
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“Multi-platform robotic colorectal surgery achieved a notably low conversion rate (1.2%).”

Background

- ✓ **Conversion** to laparoscopy or open surgery is a key quality indicator in robotic-assisted colorectal surgery.
- ✓ In Japan, insurance coverage for robotic surgery was introduced for **rectal cancer in 2018** and expanded to **colon cancer in 2022**, with a subsequent increase in case volume.
- ✓ At our institution, the **da Vinci Si** was introduced **in 2018**, followed by the **da Vinci Xi in 2020**, and the **hinotori™** robotic system **in 2024**.
- ✓ **No previous studies** have reported a comparison of **conversion rates across multiple robotic platforms**.

Surgical Robots Platform Timeline



Results

n=335	da Vinci Si (n=98)	da Vinci Xi (n=190)	hinotori (n=47)
Overall conversion rate	1.2%		
Rectal cancer (n=284)	1/98 (1.0%)	2/163 (1.2%)	0/23 (0%)
Colon cancer (n=51)	-	0/27 (0%)	1/24 (4.2%)

Reasons for conversion

- **Patient factor:** Obesity (BMI 30.7) with inadequate exposure for IMA dissection (dV Si)
 - ▮ Partial laparoscopic assistance
- **Tumor factor:** Advanced rectal cancer with massive bleeding from internal iliac artery injury during pelvic exenteration (dV Xi)
 - ▮ Open repair
 - Sigmoid colon cancer with abscess, where severe inflammation caused colonic injury during mobilization (hinotori)
 - ▮ Open procedure
- **Intraoperative factor:** Poor anastomotic bowel perfusion despite splenic flexure mobilization (dV Xi, prior Billroth II gastrectomy)
 - ▮ Open Hartmann’s procedure

Discussion

Both the hinotori and da Vinci systems are master-slave robotic platforms. Given our prior experience with the da Vinci system, the introduction of the hinotori platform was accomplished without major difficulty, and the learning curve may have been shortened. This platform familiarity may partly explain the absence of rectal conversion in hinotori cases.

Conclusions

- Overall conversion rate was notably low (1.2%) across multiple platforms.
- No rectal conversions were experienced with the hinotori platform.
- Platform similarity may facilitate proficiency, training, and safe integration, although the case volume was small...