Advanced Active Robotic TKA
; A learning curve of surgical time and alignment accuracy

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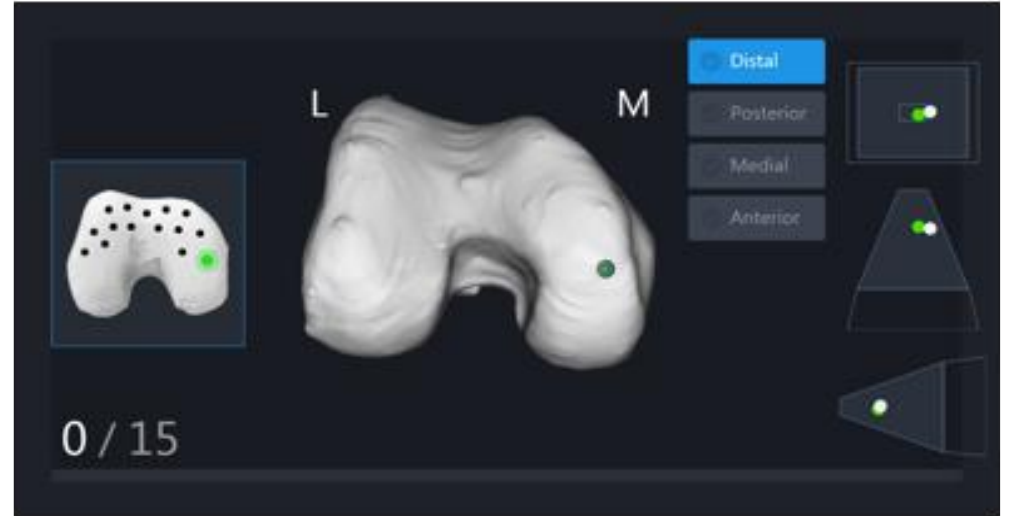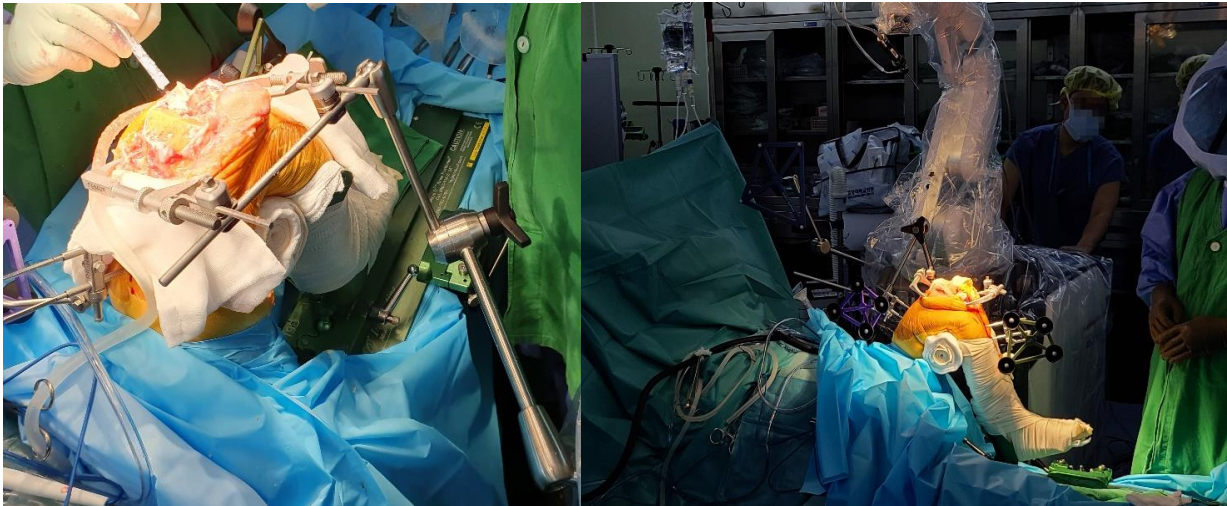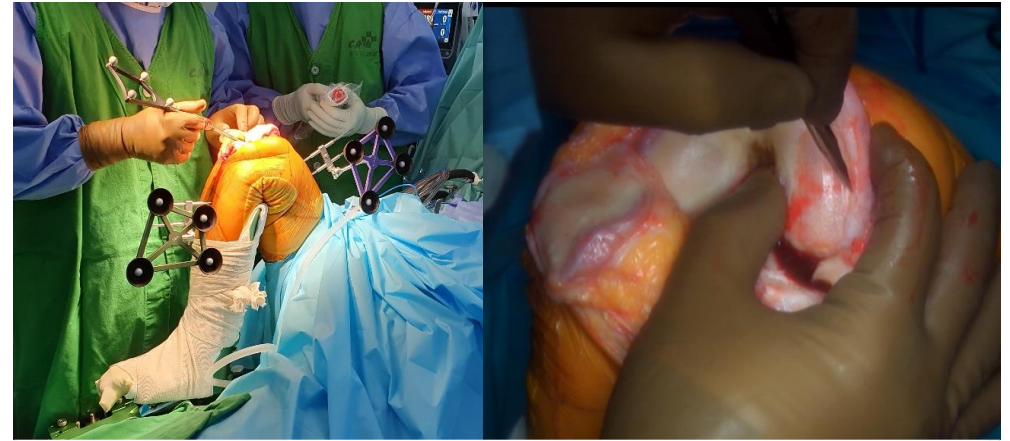# Disclosure

Yong-Beom Park

Consultant, Robot for Knee Arthroplasty, Curexo Inc.

Consultant, Cartilage Regeneration using ADSVF, Roket Health Care Inc.

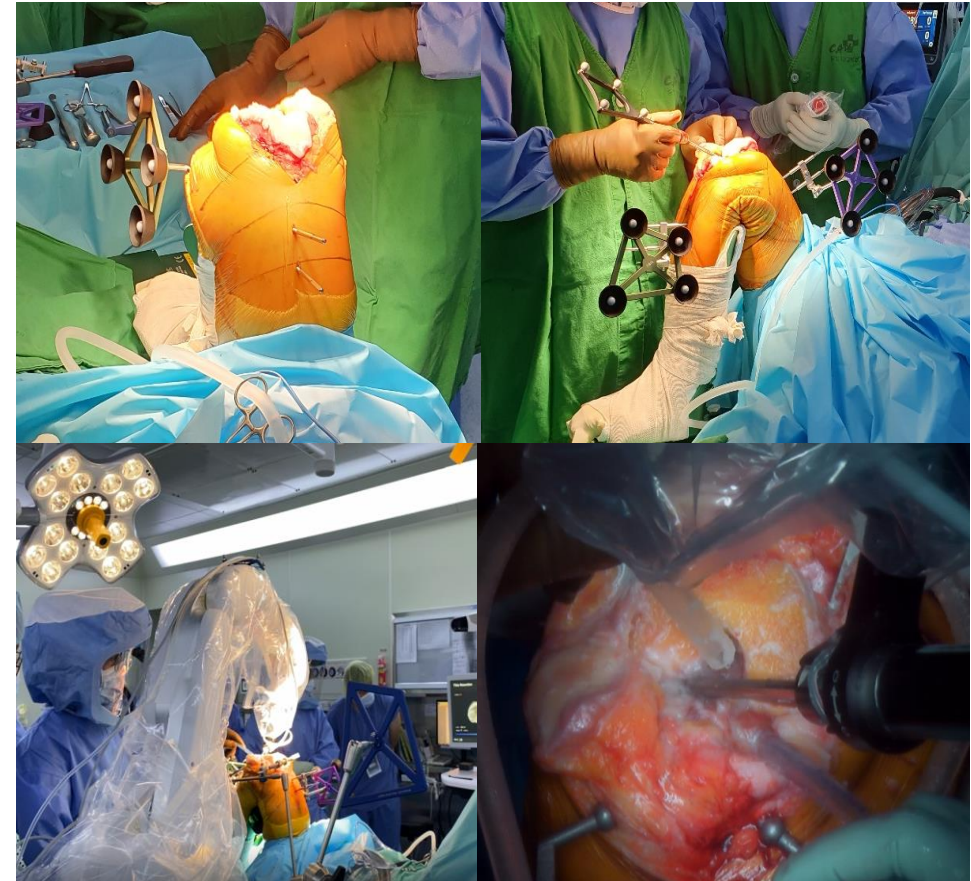# Several Robotics for TKA

New technology: Learning Curve

Purpose

- **to determine the learning curve necessary to minimize the operative time and to evaluate the alignment accuracy when using advanced active robotic TKA**
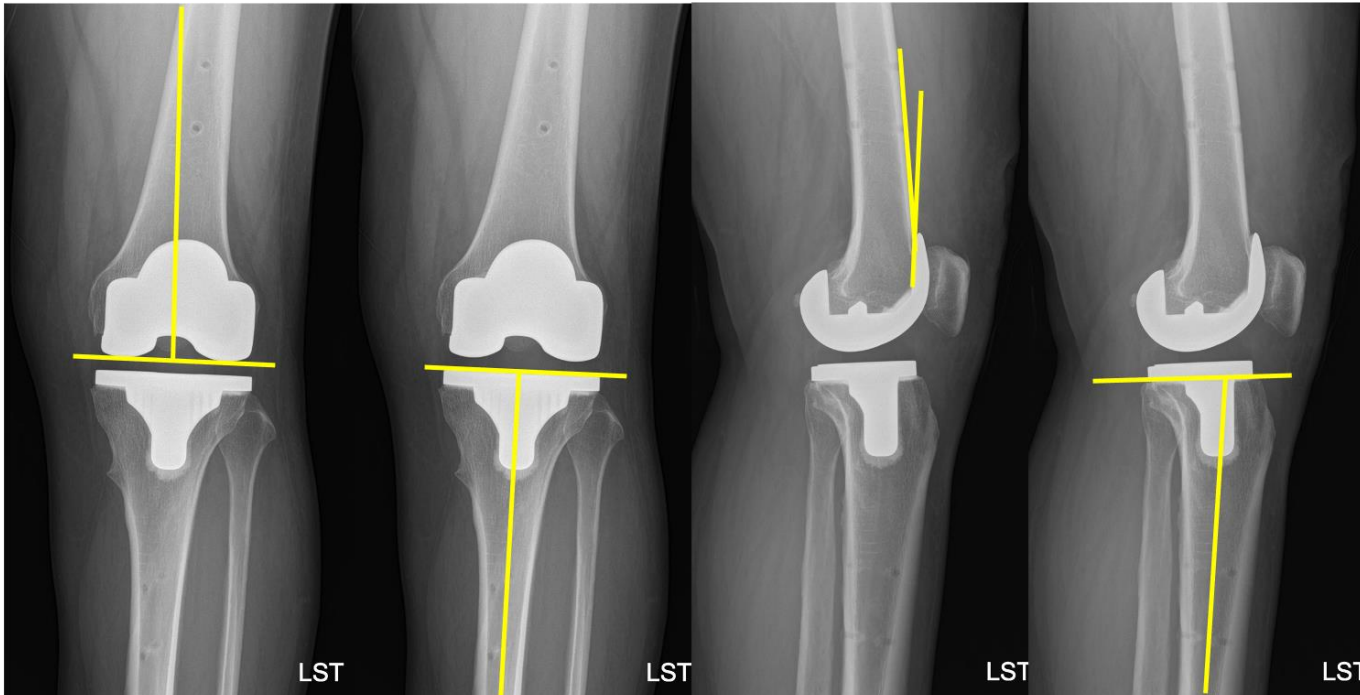
Methods: Robotic Surgery

- **TKA using newly advanced active robotic system**
  - ✓ **Robot (CUVIS-Joint®; CUREXO Inc.)**
  - ✓ **Image(CT)-base, active**

Methods: Patients & Outcome variables

- **60 consecutive primary TKAs**
  - ✓ **Age: 73.4 years, Sex: 54/6 (F/M), BMI: 27.1 kg/m^2**
  - ✓ **Preoperative HKA angle: varus 7.7°**

- **Operation time: tourniquet (incision to closure)**

- **Radiological evaluation**
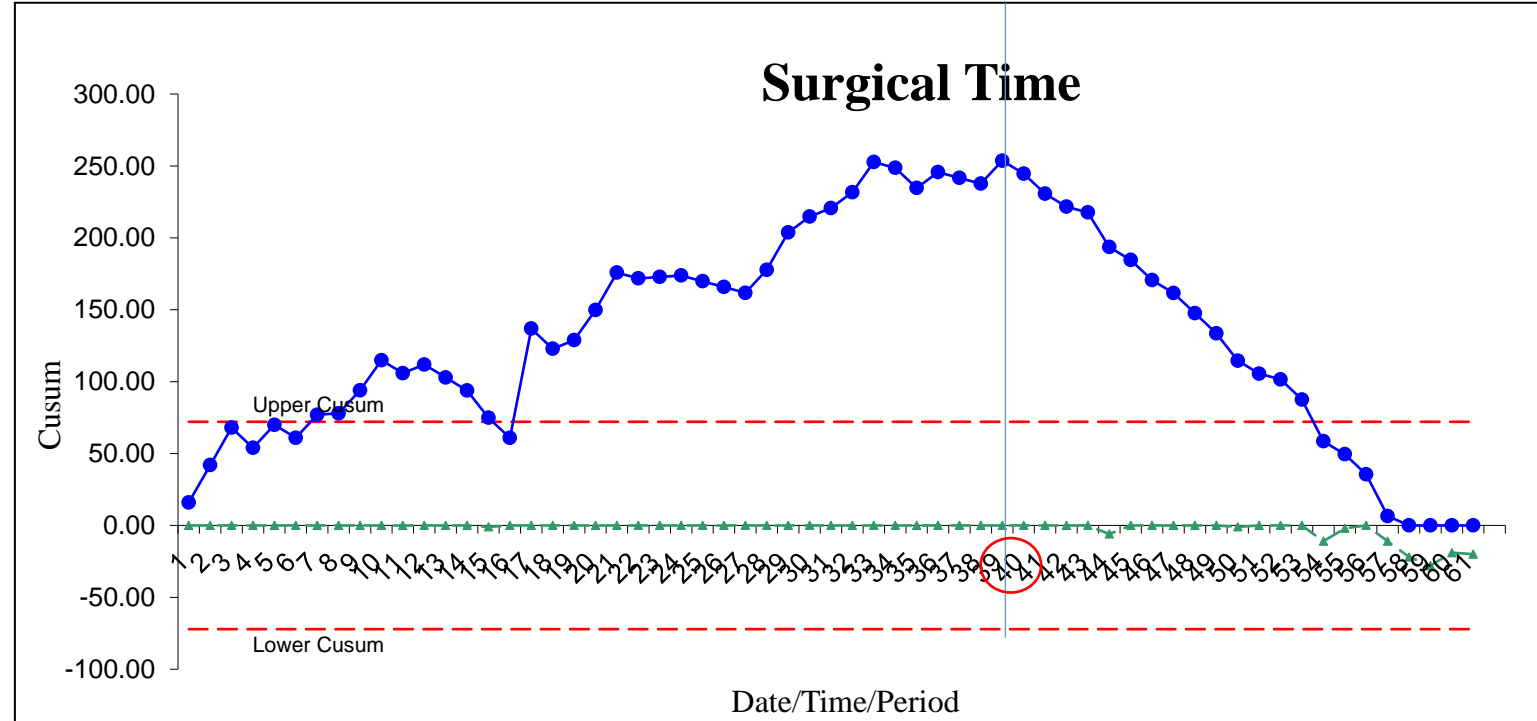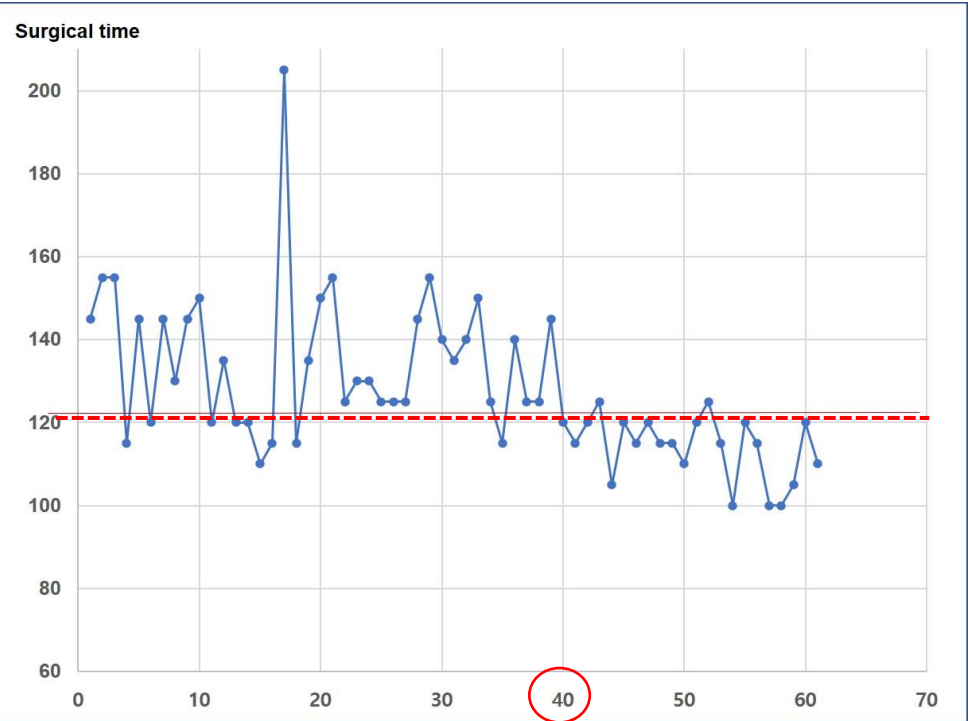 - ✓ **Alignment lower leg and component**

Methods: Statistical Analysis

- **Group classification**
  - ✓ **60 cases of robotic TKAs**
  - ✓ **6 groups according to the order of surgery (10 patients per group)**
  - ➢ **Kruskal-Wallis test & post-hoc comparison**
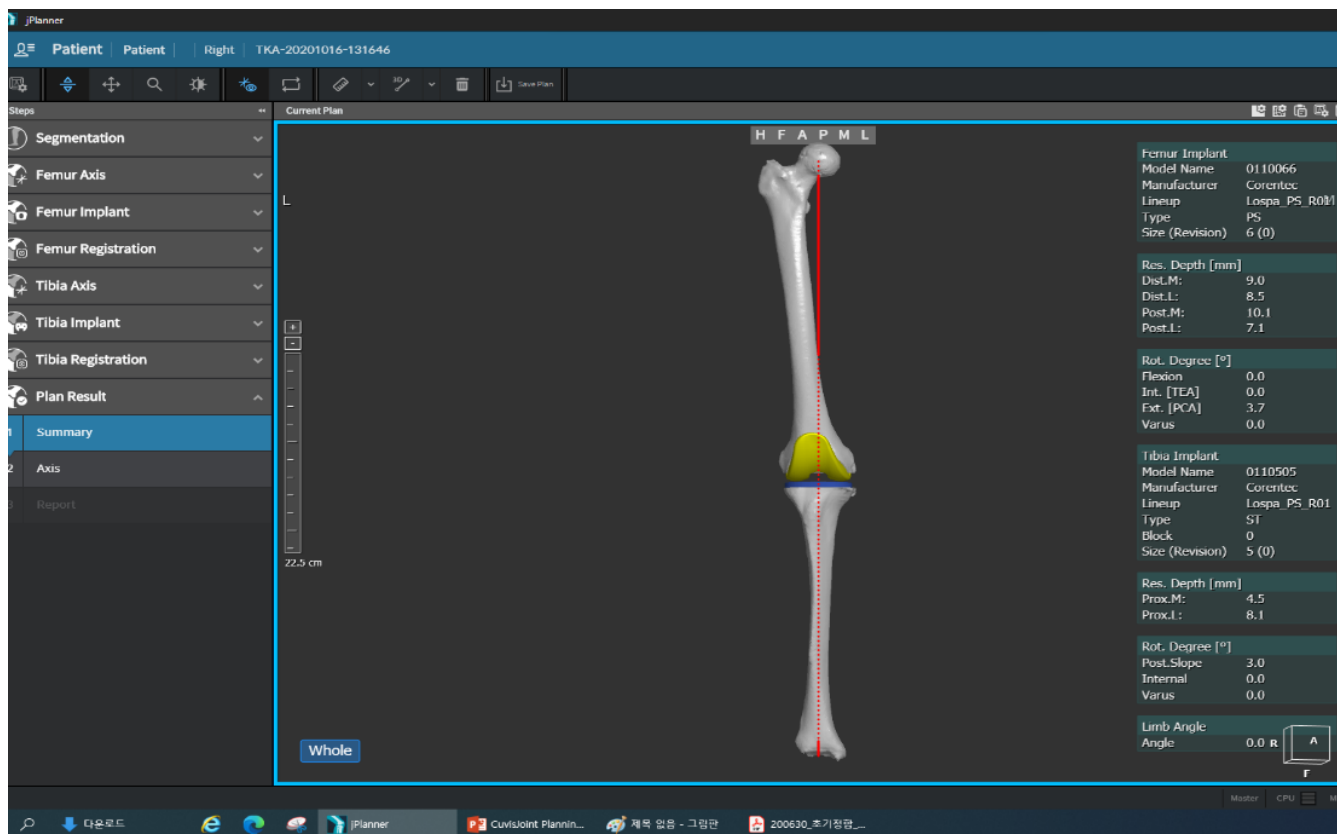
- **Cumulative summation analysis (CUSUM)**

Results: Operation Time

	Group1	Group2	Group3	Group4	Group5	Group6	
OP time	138	130	133	130	116	111	<0.001

Results: Lower Limb Alignment

	Criteria	Robot (n=60)
HKA angle	**180°±3°**	**57 (95.0%)**

	HKA angle
Preop	**7.7 varus**
Planning	**0**
Postop	**1.6 varus**

	Group1	Group2	Group3	Group4	Group5	Group6	
HKA angle	**1.9**	**1.5**	**1.7**	**1.5**	**1.6**	**1.4**	**0.126**

Results: Component Alignment

	Criteria	Proportion(n=60)	angle
α	90°±3°	59 (98.3%)	89.1°
β	90°±3°	58 (96.7%)	89.3°
Γ	0°±5°	56(93.3%)	2.8°
δ	87°±3°	55(91.7%)	85.6°

	Group1	Group2	Group3	Group4	Group5	Group6	
α	89.1	89.3	89.0	89.2	89.1	89.0	0.845
β	89.4	89.1	89.3	89.3	89.2	89.5	0.548
γ	3.0	2.7	2.9	2.8	2.7	2.7	0.779
δ	85.5	86.1	85.3	85.6	85.4	85.7	0.128

Conclusion

- **Robotic TKA with advanced active robotics**

  ✓ **Operative time: 40 cases for learning curve**

  ✓ **Accuracy: no learning curve**

    ➢ **Favorable accuracy**

       :Lower limb alignment

       :Component alignment, especially coronal plane

References

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