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## **Intelligent Surgical robot for fracture reduction**

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Pelvic fractures are the most complex orthopedic trauma, and the mortality and disability rate rank first among all fractures. The biggest challenge of surgical treatment is fracture reduction. "Intelligent Surgical Robot for Fracture Reduction" is the latest achievement of the interdisciplinary collaboration between Beijing Jishuitan Hospital and Beihang University. Beijing Rossum Robot Technology Co., Ltd. is devoted to promoting product transformation.

In 2021, the system carried out the first clinical trial of robot-assisted pelvic fracture reduction around the world in Beijing Jishuitan Hospital. The excellent and good rate of closed pelvic fracture reduction was 95% in 22 patients, which significantly improved the minimally invasive treatment effect of complex fractures. At present, the system has completed product testing and entered the multi-center clinical trial.

The system achieves three-dimensional registration based on preoperative and intraoperative images to realize real-time navigation for fractured bones. The innovative automatic surgical planning technology based on geometric constraints is proposed to realize high-precision and personalized surgical planning. The force-position feedback control is applied in this robot system to establish high-precision operation under a heavy payload.

### **Recent Publications**

1. Wang, Y. Campbell's Operative Orthopaedics, 13th ed.; Peking University Medical Press: Beijing, China, 2009.
2. Court-Brown, C.M.; Caesar, B. Epidemiology of adult fractures: A review. *Injury* 2006, 37, 691–697.
3. Bhandari, M.; Guyatt, G.H.; Swiontkowski, M.F.; Tornetta, P., III; Hanson, B.; Weaver, B.; Sprague, S.; Schemitsch, E.H. Surgeons' preferences for the operative treatment of fractures of the tibial shaft: An international survey. *JBJS* 2001, 83, 1746–1752

### **Biography**

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