



Surgery

Magnetic Levitation in Surgery

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Background

Surgeons face daily challenges whilst performing minimally invasive surgery procedures. Vision of the surgeon is limited in the confined closed space of the abdominal cavity. Although laparoscopic instrumentation is available for both diagnostic and surgical procedures, “blind spots” can be reached only with exceptional dexterity on behalf of the surgeon.

Magnetic levitation techniques apply a magnetic field to levitate or suspend a magnetic object based on the interaction between the magnetic object and the applied magnetic field. A magnetic object can also be levitated and stabilized in a magnetic system with an electronic feedback control to dynamically adjust one or more electromagnets in the system to stabilize the magnetically levitated object at a desired location.

There is a need to enhance the surgeon’s diagnostic and therapeutic capabilities in minimally invasive surgical procedures such as laparoscopic surgery. Magnetic levitation is a unique solution that has the potential to change the future of surgery.

Market

Minimally invasive surgery has gained a major role in the various surgical procedures during the last decade. Laparoscopic cholecystectomy is possibly the most common laparoscopic operation and in 2003 between 500,000 to 600,000 laparoscopic cholecystectomies were performed in the US, which

comprised 25% of the operations in general surgery that year. Since then laparoscopic surgery has become even more common and today minimal invasive surgery is the preferred type of surgery in many types of operations.

The Innovation

Our magnetic levitation platform can be inserted into a patient's abdominal cavity to perform diagnosis or a surgery procedure with a significantly reduced level of incision and an enhanced field of vision and operation. The platform can include a light, a video camera, a wireless communication unit to wirelessly transmit the images outside the magnetic platform and the wireless control of a surgical instrument mounted on the levitated magnetic platform that is capable of performing surgical procedures in the abdominal cavity.

R&D Program

- Produce an advanced prototype
- Perform an in-vivo experiment in a pig

Contact

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