

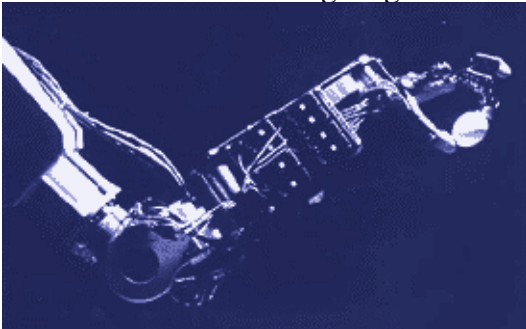
ENDOBOTS

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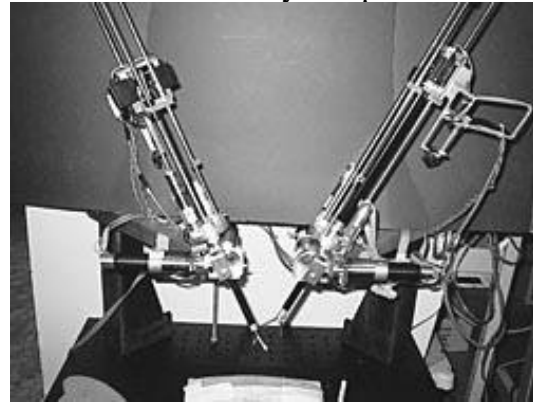
Surgery traditionally involves making a large incision to access the part of the body needing attention. The incision and the dissection needed to allow the surgeon to view the area contribute to delayed patient recovery and cause great pain.

A relatively new procedure called MIS (Minimally Invasive Surgery) uses specialized instrument designed to enter into the body through several tiny punctures. One of the instruments is a special video camera that allows the surgeon to view the area being operated on. The surgeon must coordinate the hand motions that controls the tool, with the remote visual display of the operation being performed by the end-tool. This causes an extended learning curve for the surgeon to gain the required skill and dexterity to perform the surgery. There is also a 50% time variance among surgeons.



These problems caused engineers to design new robots to assist surgeons in MIS's. A surgeon performs the operation remotely, with a robot completely under the their command. The role of the robot is to filter out tremors and disturbances of the surgeon's hands. Surgeons still had

problems because certain aspects of controlling the robots required a very high level of skill. Suturing, ligation, and tissue dissection are very difficult because of knot tying and the precision needed to successfully complete them.



The latest of these robots has solved most of these problems. The surgeon can run the Endobot in three different settings. Completely manually, as with previous robots, collaboratively, where some motions of the robotic device are under computer control while others are under the control of the surgeon, or autonomously, where the complete device in under computer control with the surgeon's supervision. This allows the Endobot to do parts of the surgery without any surgeon input. Suturing, stitching and other such procedures take seconds instead of minutes.

In the Future Endobots will be able to perform more procedures autonomously, additional joints may be added to the end of the tools to enhance dexterity, and drills, reamers, and other tools that would be needed for minimally invasive hip and knee replacements may be added.