Matrix Lesson 31

All laparoscopic cables and tubing become intertwined, despite any attempt at logical arrangement

The Laparoscopic Revolution forever changed the face of general surgery. Its introduction has caused surgeons to re-orient their view of operative surgery. To a degree, all working general surgeons must now be basic physicists. Many great physicists have contributed to the field of laparoscopic surgery. One of the greatest contributions was by René Descartes. Matrix Lesson 31 is based on the pioneering work of this brilliant physicist.

A mathematician and philosopher (he could add and, at the same time think about why he was adding), Descarte contributed greatly to an understanding of laparoscopic physics. His theory of vortices accounts for many explanations in today's operating rooms. His "Rational Basis for Hypothesis of Creation of the Solar System" explains many of our laparoscopic light source problems.

But it is for his Vortex Theory that he is remembered most by surgeons. Studying the logic theory of tube placement, he became fascinated by the evolving randomness of a concerted non-random action. He initially studied the placement of tubes in the laboratory. Eventually he became hospital-based and geographically full-time. Subsequently, he became operating room-based. Reducing tube and wire placement to a mathematical equation occupied his later years.

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This burgeoning discipline of studying tubes and cords is at the heart of laparoscopic surgery. Hitherto neatly operative fields are now coiled affairs with flowing fluids, electrical cables and gas lines. Descartes anticipated this arrangement and decided that it needed to be formulated into a mathematical model.

Just prior to his death, he wrote his Vortex Theory in German, *Die Tuben Verschimmelt*, in which he states his theory that all laparoscopic cables and tubes become randomly intertwined, despite the surgeon's efforts to straighten them out.

I have translated *Die Tuben Verschimmelt* and present it to the working laparoscopist as Matrix Lesson #31.

Adapted from: Gordon LA. The Physics of Laparoscopic Surgery: A Dissertation on the Contributions of Famous Physicists to Laparoscopic Surgery. *Perspectives in Biology and Medicine* 1997; 40(4).