NOT KNOTS, OR "EXACTLY LIKE SILK"

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It is difficult to put a finger on the exact point in time when the wrong turn was made with suture material. It was, however, an ineluctable transgression, and its course can be imagined generally with no great effort and a fair chance of accuracy.

Some ancient sawbones holding onto the stump of a femoral artery and seeking desperately for a means to let go, grasped a length of silk thread and tied it off. Silk is a multistrand fiber with the resultant inequalities and surface irregularities sufficient to bind it on itself by friction when tangled. Several hundred or thousand years before our surgeon saw the light of day, a marvelous Chinaman had discovered this peculiar propensity of the silk thread. After years of trial and error, he produced a systematized tangle that he referred to as a "knot." Just how he spelled this simple word and how he pronounced it need not concern us.

Nonetheless, the surgeon, with crimping fingers, had learned this trick, and he tried it on the femoral artery. Both he and the patient were extremely pleased with this accomplishment; so pleased, in fact, that doctors are still married to this maneuver.

There was nothing to criticize in this treatment of silk and its application to surgery. The same techniques proved effective with linen and cotton since they had the same physical characteristics. No one claimed that these substances would prove forever the best, but unquestionably they were the best available at that time.

Strands of silver and subsequently, of steel became available. These had advantages over silk in some respects. It was monofilament and did not incubate bacteria in its interstices. Its surface was smooth and it did not bind on itself by friction as did silk. In fact, it was not at all suited to knotting, but the poor surgeon had been so completely trained by then that he knotted it anyway. It did manage to hold, but it held its intrinsic trait to hold a bend once it was placed. Compounding this strength by the placing of multiple bends in the course of knotting, it was persuaded to hold tissue in a loop just as silk and cotton did.

Now, in retrospect, it is quite obvious that this was a wrong turning. Perhaps it happened earlier with silver wire and certainly it has happened later with all sorts of exotic material, but let's take the steel wire as a starter. If you are inclined to question this, suppose you try this test. The next time you attend your civic club meeting, go up to your good friend, the mechanical engineer, stick your chin out and state with authority, "The best way to join two pieces of stainless steel is to tie them in a knot." Now that's

settled.

Since steel didn't join too well by the knot method, the surgeon sent it back. The suture manufacturer said that tissue tolerated it better than it did silk, that bacteria abhorred it, and it was stronger if you didn't kink it. The surgeon said, how the hell would he tie it if he didn't kink it—and he added this pitiful refrain, "It ain't like silk."

So back to the laboratory—make steel like silk. Out came the multistrand, which still broke when it was kinked and offered nice little interstice homes for the hardier bacteria. And the surgeon said plaintively, "It ain't like silk."

Along came nylon and its more sophisticated cousins—dacron, teflon and all the rest of the synthetics. Nylon was stronger than silk, smoother than silk, more impervious and less reactive than silk, and its elasticity allowed the confined tissue to breathe a little. But, man, it wouldn't knot. It might fuse, and stocking manufacturers might drool over it, but back it went to the suture maker. Wailed the surgeon, "All that, yes, but it ain't like silk."

So the manufacturer made it multistrand—with interstices—and the surgeon says, “Now it knots, but it’s no better than silk.” So the manufacturer coated the multistrands to get a monostrand and straddled a fence with all the pickets in the wrong place. And it still “ain’t like silk.”

Now who is going to tell the suture manufacturer to tell the surgeon to join it together by fusion and show him how to do it? That way we can have all of the advantages and not "knots.”

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