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SILKWORM GUT AS A SUBCUTANEOUS SUTURE IN CLOSURE OF ABDOMINAL INCISIONS.¹

BY

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In March of this year Dr. Harvey, of Troy, when visiting us, suggested the use of silkworm gut as a subcutaneous suture instead of silver wire or catgut. He told us that Dr. David W. Houston, of Troy, had employed it for some time and was highly pleased with it.

Since March this suture has given such satisfaction that we employ it almost entirely. Heretofore we closed the peritoneum with catgut, the fascia and muscle with mattress sutures of silver wire or silkworm gut, and the skin with subcutaneous catgut. If the walls contained much fat it was deemed advisable to use several catgut sutures to secure accurate approximation, as there was danger of the catgut absorbing before satisfactory union had taken place. Occasionally we employed subcutaneous silver wire, which answered very well.

Our method of closure now is: (a) For the peritoneum, continuous catgut.

(b) For the fascia and muscle, mattress sutures of silver wire or silkworm gut; where the walls are thick and much tension required, usually silver wire; and where the walls are thin, silkworm gut.

(c) Subcutaneous silkworm gut, even though the walls are thick, no fat suture is employed, the adipose surfaces lying loosely one against the other. It may be mentioned that Dr. Halsted has for a long period paid no attention to the fat, merely using the subcutaneous silver wire.

It is advisable to pick out good, strong strands of silkworm

¹ Read before the Clinical Society of Baltimore, May, 1897, when nine patients closed by this method were exhibited.

Name.	Date.	Nature of operation.	Thickness of abdominal wall.	Layers of sutures.	When removed.	Difficulty.	Result.	Remarks.
S. McC.	March 31st, 1897.	Myomectomy.	Thick		Twenty-fifth day.	None	Perfect.	
A. H.	April 24th, 1897.	Hystero-myomectomy.	"		Twenty-first day.		"	
E. W.	April 12th, 1897.	Nephrorrhaphy.	Thin		Twenty-first day.		"	
C. S.	April 19th, 1897.	Breaking up pelvic adhesions; suspension of uterus.		(a) Catgut, (b) silver wire, (c) subcutaneous silkworm gut.		Stitch broke off and could not be removed.	"	
B. P.	April 23d, 1897.	Suspension of uterus.		(a) Catgut, (b) silkworm gut, (c) subcutaneous silkworm gut.	Eighteenth day.		"	
S. P.	May 19th, 1897.	Appendectomy.					"	
F. E.	April 19th, 1897.	Hysterectomy	Thick	(a) Catgut, (b) silver wire and catgut, (c) subcutaneous silkworm gut.	About twenty-fifth day.	None	"	
J. W. W.	May 15th, 1897.	Myomectomy and suspension of uterus.	Moderate.	(a) Catgut, (b) silver wire, (c) subcutaneous silkworm gut.	About twenty-fifth day.	"	"	
G. H.	May 12th, 1897.	Myomectomy; suspension of uterus.	Thick	(a) Catgut, (b) catgut, (c) silkworm gut.	About twenty-fifth day.	"	"	
S. B. T.	May 10th, 1897.	Hystero-myomectomy.	"	(a) Catgut, (b) silver wire, (c) subcutaneous silkworm gut.	About twenty-fifth day.	"	"	
R. A.	May 28th, 1897.	Nephrorrhaphy and suspension of uterus.	Thin.	(a) Catgut, (b) silver wire, (c) subcutaneous silkworm gut.	About nineteenth day.	"	"	
B. S.	May 24th, 1897.	Hystero-myomectomy.	"	(a) Catgut, (b) silver wire, (c) silkworm gut.		An attempt was made to remove on twenty-fifth day, but unsuccessful, as suture broke off.	"	
F. R.	May 17th, 1897.	Suspension of uterus.	Moderate.	(a) Catgut, (b) silver wire, (c) silkworm gut.	Twenty-fifth day.	None	"	There was a kink evidently due to one loop of ligature being caught by the next.
K. D.	May 14th, 1897.	Removal of parovarian cyst.	"	(a) Catgut, (b) silver wire, (c) silkworm gut.		Ends broke off	"	Abdominal incision broke down and a large quantity of pus escaped; evidently some infection down near the muscle.
A. D.	April 21st, 1897.	Repair of perineum; suspension of uterus.	"	(a) Catgut, (b) silver wire, (c) subcutaneous silkworm gut.		None	Fair	
A. W.	May 14th, 1897.	Removal of left tubovarian mass.	"	(a) catgut, (b) silver wire, (c) subcutaneous silkworm gut.	Twenty-third day.	"	Perfect.	

SUTURE IN CLOSURE OF ABDOMINAL INCISIONS.

Author	Date	Operation	Condition	Material	Time	Result	Remarks
A. P.	May 14th, 1897.	Nephrorrhaphy	Moderate	(a) Catgut, (b) silkworm gut, (c) subcutaneous silkworm gut.	Twenty-third day.	None	Perfect.
S. E. C.	June 6th, 1897.	Cure of umbilical hernia.	Thick	(a) Catgut, (b) catgut, (c) subcutaneous silkworm gut.	Eighteenth day.	"	"
M. H.	May 20th, 1897.	Hystero-myomectomy	Moderate	Subcutaneous silkworm gut.	Twenty-third day.	"	"
C. L.	May 22d, 1897.	"	"	(a) Catgut, (b) silver wire, (c) subcutaneous silkworm gut.	Attempted removal 4th, twenty-fifth day.	Ends broke off left <i>in situ</i> .	Long incision; should have been two sutures.
M. E.	May 17th, 1897.	"	Thin	(a) Catgut, (b) silkworm gut, (c) subcutaneous silkworm gut.	About twenty-fifth day.	None	"
E. W.	May 22d, 1897.	Release of general pelvic adhesions.	"	Peritoneum, catgut; fascia and muscle, silver wire; subcutaneous silkworm gut.	About twenty-third day.	"	"
M. K.	May 24th, 1897.	Double hydrosalpinx; both tubes opened and washed out.	"	(a) Catgut, (b) silkworm gut, (c) subcutaneous silkworm gut.	Twenty-second day.	"	"
J. S.	May 21st, 1897.	Hystero-myomectomy	"	(a) Catgut, (b) silver wire, (c) subcutaneous silkworm gut.	Twenty-seventh day.	"	Silver stitch came almost to surface, and caused slight irritation for five days.
L. N.	June 7th, 1897.	"	Moderate	(a) Catgut, (b) silver wire, (c) subcutaneous silkworm gut.	Eighteenth day.	"	"
W. H. H.	June 16th, 1897.	Suspension of uterus	Thick	(a) Catgut, (b) silkworm gut, (c) subcutaneous silkworm gut.	Tenth day.	"	"
L. M.	May 31st, 1897.	Appendectomy	Thin	(a) Catgut, (b) —, (c) subcutaneous silkworm gut.	Nineteenth day.	"	"
L. K.	May 31st, 1897.	Suspension of uterus	"	"	About twenty-third day.	"	"
F. McL.	May 29th, 1897.	Amputation of cervix; repair of outlet; suspension of uterus.	Thin	(a) Catgut, (b) silkworm gut, (c) subcutaneous silkworm gut.	Twenty-third day.	"	"
H.	May 31st, 1897.	Repair of perineum; myomectomy; suspension of uterus.	Thick	(a) Catgut, (b) silver wire, (c) subcutaneous silkworm gut.	Stitch broke off.	"	"
E. E.	May 23d, 1897.	Nephrectomy	Thin	(a) Catgut, (b) silver wire, (c) subcutaneous silkworm gut.	Twenty-second day.	None	"
A. M.	June 9th, 1897.	Removal of small cyst of right ovary.	"	(a) Catgut, (b) silkworm gut, (c) subcutaneous silkworm gut.	Fourteenth day.	"	"
E. T.	June 7th, 1897.	Suspension of uterus	"	"	Thirteenth day.	"	"
E. G.	May 31st, 1897.	"	Thin	(a) Catgut, (b) silkworm gut, (c) subcutaneous silkworm gut.	Twenty-first day.	"	"
M. S.	June 7th, 1897.	Removal of a fibroma of left ovary; suspension of uterus.	"	(a) Catgut, (b) —, (c) subcutaneous silkworm gut.	Seventeenth day.	"	"
M. T.	June 16th, 1897.	Appendectomy; suspension of uterus.	"	(a) Catgut, (b) silver wire, (c) subcutaneous silkworm gut.	Tenth day	"	"
J. C.	June 16th, 1897.	Hystero-myomectomy	Very thick.	(a) Catgut, (b) silver wire, (c) subcutaneous silkworm gut.	Tenth day	Slight	Long incision.
R. McC.	May 26th, 1897.	Myomectomy	Moderate	(a) Catgut, (b) silver wire, (c) subcutaneous silkworm gut.	Twenty-third day.	"	"

gut, and where the incision is long a new strand should be inserted every six or seven centimetres; the ends are then tied together.

Advantages.—This suture is very pliable, does not kink, and if good will not break. It may be left in place one month, or more if desired, and causes little or no irritation.

Disadvantage.—It is occasionally so firmly embedded in the tissues that it will break off.

The Removal of the Continuous Suture.—It may be looked at about the tenth day, and, if union be satisfactory, removed; if desirable it may be left much longer. Where the suture is short it can often be removed by the slightest traction; if the incision be a long one the knots where the sutures join are cut and firm and steady traction is made with a pair of artery forceps. Should the silkworm gut break off beneath the skin the remaining piece is left behind, as is the case when silver wire breaks.

The accompanying is a synopsis of thirty-eight cases, operated upon by Dr. Kelly and myself since March, where subcutaneous silkworm gut was employed.

From a perusal of these cases it will be seen that in two a knot had been formed which prevented the removal of the suture. Here the needle had retraced its steps, catching in the loop that had just been formed. Such a mistake is easily avoided after one has once been put on his guard. In four cases the sutures broke; this fault we have overcome by making the sutures shorter where the incision is long, employing two or even three sutures instead of one long one.

Dr. Houston has employed this method of closure since May, 1895, using it not only in abdominal surgery, but also in all kinds of operative work. He finds it especially suited to wounds on the face, where very fine strands are employed, and can be removed at the end of forty-eight hours or longer.

At the meeting of the Society Dr. J. W. Williams said that he had used this method in closing the abdomen for one and a half years and was thoroughly satisfied with it. Whether this suture has been adopted or not by others we cannot say, but it is one that may well be utilized by the profession at large.