

# Clinical Review

## Veritas® Collagen Matrix



Veritas® Collagen Matrix

*Veritas is a collagen matrix used to repair complex abdominal defects.*

- *Excellent strength and suture retention*
- *Remodels into tissue indistinguishable from host tissue*
- *Ready to be used out of package - no rehydration required*
- *Consistent and uniform*
- *Minimizes tissue attachment in case of direct contact with viscera*

## Veritas® Collagen Matrix in Complex Abdominal Wall Reconstruction



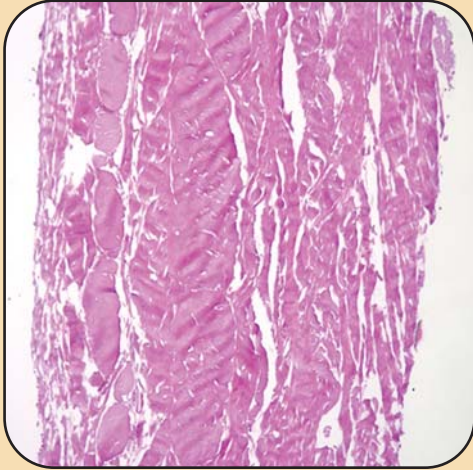
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### BACKGROUND

Ventral/incisional hernias complicate 11-20% of laparotomies.<sup>1</sup> Repair of the hernias with primary fascial closure has a rate of recurrence of up to 50%.<sup>1</sup> Given this high rate of recurrence there has been an emphasis on the development of techniques and materials to improve the outcomes of repair. Synthetic biomaterials have significantly improved the results of ventral hernia repair by minimizing tension on the repair. While prosthetic mesh has decreased the recurrence rates it may be accompanied by infection, mesh extrusion, adhesions and enterocutaneous fistulae.<sup>1,2</sup>

## VERITAS GRAFT OUT OF THE PACKAGE

H&E Stain



Trichrome Stain



*Veritas is an acellular matrix which offers an ideal scaffold for cellular infiltration and blood vessel growth.*

Women who have cancer of the ovary undergo large abdominal incisions for debulking of ovarian cancer. They receive chemotherapy within 5-21 days using cytotoxic and emetogenic drugs. The abdominal wall is at risk of poor healing due to the catabolic effects of the cancer, the subsequent chemotherapy and abdominal tension from the nausea and vomiting. They often have reoperation for recurrent disease, bowel obstruction, tumor debulking or hernia. Closure of the abdominal wall in these circumstances may be difficult. If a graft is placed it may be in contact with bowel or the wound may be contaminated by bowel resection and anastomosis. Until recently the choice for grafting material was synthetic biomaterials, which have up to a 16% infection or enterocutaneous fistula rate. In the past few years, biologic products have been introduced into hernia repair operations. They allow complete connective tissue ingrowth and neovascularization without a foreign body response typical of synthetic materials.

A biologic material recently introduced for the repair of soft tissue deficiencies is Veritas® Collagen Matrix. Veritas is a remodelable material derived from bovine pericardium. It is ready to use out of the package and does not require rehydration. Additionally, Veritas minimizes tissue attachment to the device in case of direct contact with viscera; a critical characteristic for the more complex abdominal wall reconstruction procedures. This product has been used for over five years as a graft reinforcement material in the treatment of vaginal prolapse and stress urinary incontinence. It has achieved excellent results with no reports of erosion to date and a very low adverse event rate of <.05%.<sup>3</sup> My experience with the biologic grafts for abdominal wall reconstruction began with patient number one.

### CASE #1

This is a 54 year-old woman who originally had ovarian cancer diagnosed in January 1991. She had a hysterectomy and tumor debulking followed by Cisplatin chemotherapy. In September 1999 she had laparotomy and biopsy of recurrent disease. She received Carboplatin/Taxol chemotherapy. On 4/19/02 she underwent partial gastrectomy, splenectomy, Billroth II, and gastrojejunostomy for recurrent disease. On 1/16/04 she had a 12 x 14 cm abdominal wall recurrence, which extended through the fascia into the lower abdomen and pelvis. (Figure 1) She underwent an abdominal wall resection of the tumor in continuity with the apex of the bladder, sigmoid, and descending colon. She had a right colon to sigmoid anastomosis and partial bladder resection.

The 12 cm x 14 cm lower abdominal fascial defect was closed with two layers of Veritas tailored to 12 cm x 14 cm. The first was placed as an underlay graft to the fascia, in the immediate area of the bowel anastomosis to avoid the complication of bowel fistula. The second piece was onlayed to the ventral surface of the fascia. (Figure 2) The skin was primarily closed. It was opened approximately 10 days later to evacuate a sterile, purulent fluid collection. There was no erythema and no tissue reaction. The Veritas graft could be seen, it stayed intact and uninfected and over the next three months the 12 cm x 14 cm

*“There was no erythema and no tissue reaction. The Veritas graft could be seen, it stayed intact and uninfected and over the next three months the 12 cm x 14 cm fascial defect closed over with granulation tissue followed by squamous epithelium.”*



**Figure 1:** Photo of Case #1 with the hand squeezing the tumor that is to be resected with the overlying fascia. The cephalad end of the incision has tumor eroding through the previous scar.



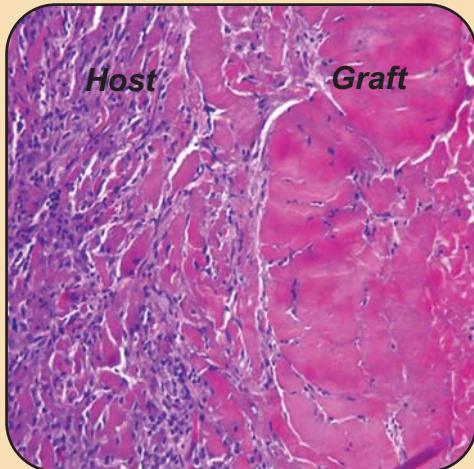
**Figure 2:** Appearance of the abdomen with the graft in place over the lower abdomen. The upper abdominal fascia was closed primarily.

fascial defect closed over with granulation tissue followed by squamous epithelium. A series of photographs demonstrates the healing process. (Figures 3-5) At 2 years post-op, this patient has no fascial defect and a normal, pliable abdominal wall.

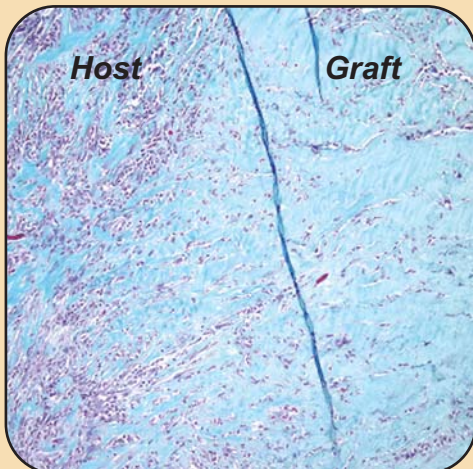
This excellent result with Veritas graft in a very high-risk patient encouraged me to use Veritas graft for repair of incisional hernias in the following 3 patients.

**VERITAS GRAFT  
THREE MONTHS  
AFTER IMPLANT  
(CASE #4)**

H&E Stain



Trichrome Stain



*Host fibroblasts are infiltrating the graft and bringing native collagen to the graft.*



**Figure 3:** (Case #1) Appearance of the wound three weeks postop. The Veritas graft can be seen in the center and granulation tissue is growing over the edge.



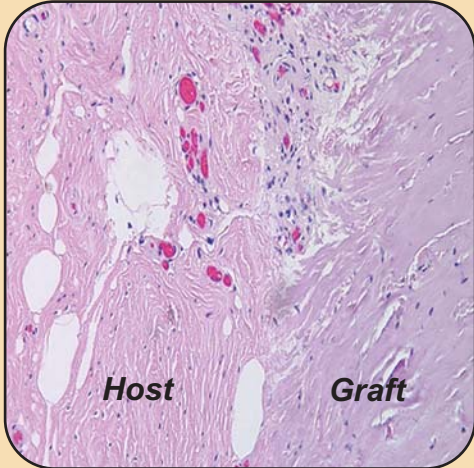
**Figure 4:** (Case #1) The wound has nearly closed at 10 weeks post surgery.



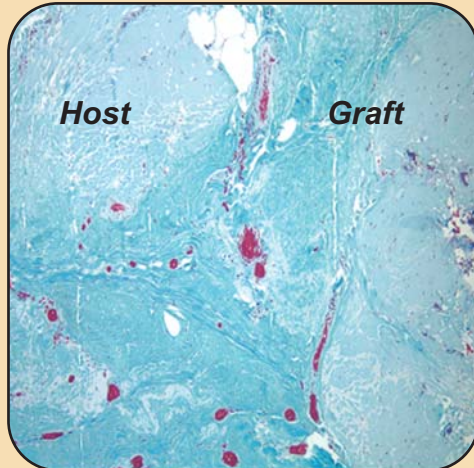
**Figure 5:** (Case #1) Appearance of the wound one year after surgery with no fascial defect and a normal pliable abdominal wall.

**VERITAS GRAFT  
TWENTY MONTHS  
AFTER IMPLANT  
(CASE #2)**

**H&E Stain**



**Trichrome Stain**



*Graft has capillaries and appears to have mature collagen.*

**CASE #2**

This is a 63 year-old female with cancer of the ovary, initially diagnosed 3/22/01. She had a midline incision going around the umbilicus through which she was debulked and staged. She received Carboplatin and Taxol chemotherapy for six cycles and developed a large incisional hernia. She had no evidence of disease until March 2003 when she had an elevated CA125 and received six cycles of Carboplatin. In July 2004 her CA125 elevated again. She underwent an exploratory laparotomy on 8/11/04 to repair the incisional hernia and to evaluate her cancer status. Her hernia was 20 cm long by 10 cm wide. She is not a diabetic and her hematocrit was 29. She weighs 242 pounds and 5'3" tall. Her BSA is 2.1.

The surgical hernia repair included a 0 polydioxinone double stranded running suture to the fascia. Two Veritas grafts, tailored to 15 cm x 4 cm in size were sewn together and placed onlay to the anterior fascia 2 cm from the edge of the hernia defect using 0 polydioxinone suture.

On 4/12/06 she was reoperated to remove recurrent cancer in the pelvic lymph nodes. A portion of the fascia was removed for histologic study. Her long-term follow-up reveals a strong abdominal incision with no recurrent hernia.

**CASE #3**

This is a 68 year-old female, 5'6" tall, 144 pounds. She had ovarian cancer diagnosed in 1990 and treated with hysterectomy, oophorectomy, and staging. She recurred in November 2000 and on 11/8/00 underwent partial bowel resection and resection of a portion of the ureter, base of her bladder, part of the vagina, and reconstruction. Postoperative she received chemotherapy with Cisplatin and Gemcitabine. She developed an incisional hernia approximately four weeks after the original surgery due to nausea and vomiting with the chemotherapy. On 12/9/05 she underwent exploratory laparotomy to repair the hernia and to address a rising CA125. The hernia was 8 cm x 12 cm in size and recurrent cancer was found at surgery.

The fascia was closed primarily with 0 polydioxonone double stranded suture and a 4 cm x 15 cm Veritas graft was placed onlay to the fascia. The preop hematocrit was 39 and she was not diabetic. She is receiving chemotherapy. There was complete healing and no hernia 12 months later.

**CASE #4**

This is a 51 year-old female, 5'6" tall, 183 pounds. She had a granulosa cell tumor of the ovary, treated by hysterectomy, bilateral salpingoophorectomy and staging on 10/27/98. She had a recurrence 3/17/04 and had another laparotomy and resection of the tumor. Postoperatively she received chemotherapy. She developed a large incisional hernia that was 20 cm vertically and 15 cm laterally. On 1/6/06 we did an exploratory laparotomy and resected another 4 cm tumor from the descending colon. We repaired the hernia with 0 polydioxinone suture and then placed a Veritas graft, 10 cm x 16 cm onlay to the anterior fascia. She received chemotherapy. Her hematocrit was 37, and she is not diabetic.

*“Veritas graft appears to be an ideal biologic material to repair abdominal wall defects.”*

Postoperatively she developed a seroma in the subcutaneous tissue, which was drained twice. Three months after the repair the mass around the seroma seemed to solidify and the inhibin level elevated to 151. We were concerned about a tumor implant in the wound and she underwent resection of the seroma with the surrounding tissue. The graft could not be identified as an independent structure. It was indistinguishable from the abdominal wall fascia. We opened the fascia and did a second look procedure to identify the source of the inhibin. A small strip of the fascia was sent with the specimen to pathology. The histology of that showed normal connective tissue. Eleven months later the hernia has not recurred.

## DISCUSSION

The goal in these cases was to use a collagen based material that would be replaced by the patients’ own connective tissue making the abdominal wall fascia thicker and prevent formation of a hernia. There were no hernia recurrences from these four patients.

Based on these results and its superior handling characteristics, Veritas graft appears to be an ideal biologic material to repair complex abdominal wall defects.

## REFERENCES

1. Luijendijk R, et al. A comparison of suture repair with mesh repair for incisional hernia. The New England Journal of Medicine, 2000; Volume 343, No. 6, pg 392-398.
2. Leber G, et al. Long-term complications associated with prosthetic repair of incisional hernias. Arch Surg, 1998; Volume 133, No. 4, pg 378-382.
3. Data on file at Synovis Surgical Innovations.

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