

Successful Pregnancy and Delivery after Autologous Abdominal Wall Reconstruction using Anterolateral-Thigh and Iliotibial-Tract Flap

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Summary: The surgical management of abdominal wall tumor in women with childbearing potential is a thorny issue. A synthetic mesh is widely used for abdominal wall reconstruction but not necessarily applicable in case of women of childbearing potential because it has been reported to cause severe pain during pregnancy. Autologous reconstruction is usually considered a feasible option for such cases; however, there is no consensus on this approach and almost no evidence to support it. In the present 2 cases, 2 female patients (age, 17 years and 35 years) with abdominal wall desmoid tumor underwent primary radical resection and autologous reconstruction of an abdominal wall defect in the lateral oblique muscle area (defect size, 13×5 cm and 8×6 cm) using an anterolateral thigh and iliotibial tract flap. The postoperative course was uneventful. Both patients achieved pregnancy and a full-term delivery without complications with the exception of a feeling of mild stretching in the area of the operation. Magnetic resonance imaging and a clinical examination after the delivery revealed no signs of abdominal wall hernia or bulging. Normal pregnancy and full-term delivery could be obtained after abdominal wall resection and autologous reconstruction using an anterolateral thigh + iliotibial tract flap. This reconstructive method is considered to be a versatile option for the management of abdominal wall tumor in women with childbearing potential; however, further evidence should be accumulated on the reconstruction of wider and central abdominal wall defects. (*Plast Reconstr Surg Glob Open* 2018;6:e1819; doi: 10.1097/GOX.0000000000001819; Published online 13 July 2018.)

After the resection of the abdominal wall, the reinforcement and repair of the rectus and oblique muscle structure is usually performed using a synthetic mesh. However, the mesh graft is not necessarily applicable in case of women of childbearing potential because mesh grafts have been reported to cause severe abdominal wall pain during pregnancy, especially in the third trimester.¹⁻³ With regard to future pregnancy, the surgical management of abdominal wall defects is a thorny issue. Reconstructive surgeons tend to think that autologous tissue is superior to

synthetic mesh for the reconstruction of abdominal defects in case in which there is assumed to be a possibility of future pregnancy; however, there has been almost no evidence on pregnancy and delivery after autologous abdominal wall reconstruction.

We herein report 2 cases of patients with abdominal wall desmoid tumor who achieved an uneventful pregnancy and full-term delivery after the resection of the tumor and reconstruction using an anterolateral thigh (ALT) and iliotibial tract (ITT) flap.

CASE 1

The patient was a 17-year-old girl who presented with abdominal wall desmoid tumor of 12×4 cm in size in the left groin region. A watchful waiting approach was

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Received for publication February 2, 2018; accepted April 16, 2018.

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Disclosure: Yu Kagaya, Masaki Arikawa, Eisuke Kobayashi, Akira Kawai, and Shimpei Miyamoto have nothing to disclose. No funding was received for this article. The Article Processing Charge was paid for by the authors.

Supplemental digital content is available for this article. Clickable URL citations appear in the text.

recommended in the former hospital; however, she indicated that she wished to undergo a radical resection due to the possibility of progression and the presence of unbearable pain. Autologous tissue, rather than a synthetic mesh, was chosen for abdominal wall reconstruction based on the possibility of future pregnancy. The tumor was resected with a 1- to 2-cm margin of full abdominal wall layers with the exception of the peritoneum (the abdominal wall defect was therefore at least 13×5 cm). The abdominal wall defect was reconstructed using a pedicled ALT + ITT flap (Fig. 1).

Pain relief was achieved, and the patient subsequently achieved pregnancy and underwent a full-term normal transvaginal delivery at 32 months after the operation. No local recurrence was observed, and no problematic symptoms developed during pregnancy and delivery, with the exception of a feeling of mild stretching in the area of the operation. Magnetic resonance imaging and a clinical examination after the delivery revealed no signs of abdominal wall hernia or bulging (See figure, Supplemental Digital Content 1 which displays postoperative appearance of the surgical site and MRI. A: Case

1 (48 months after the operation and at 16 months after delivery). <http://links.lww.com/PRSGO/A787>).

CASE 2

The patient was a 35-year-old woman who presented with abdominal wall desmoid tumor of 7×5 cm in size in the right groin region. She had experienced 1 delivery by cesarean section, and desired a second pregnancy. The tumor was not associated with any problematic symptoms; however, after considering the risk of tumor progression during pregnancy, she chose to undergo primary resection. Similarly, to case 1, autologous tissue, rather than a synthetic mesh, was chosen for abdominal wall reconstruction based on the possibility of future pregnancy. The tumor was resected with a 1- to 2-cm margin of full abdominal wall layers with the exception of the peritoneum (the abdominal wall defect was therefore at least 8×6 cm). The abdominal wall defect was reconstructed using a free ALT + ITT flap.

The postoperative course was uneventful in the same way as case 1. She subsequently achieved pregnancy and underwent a full-term delivery by cesarean section at 22 months after the operation. There were no signs of

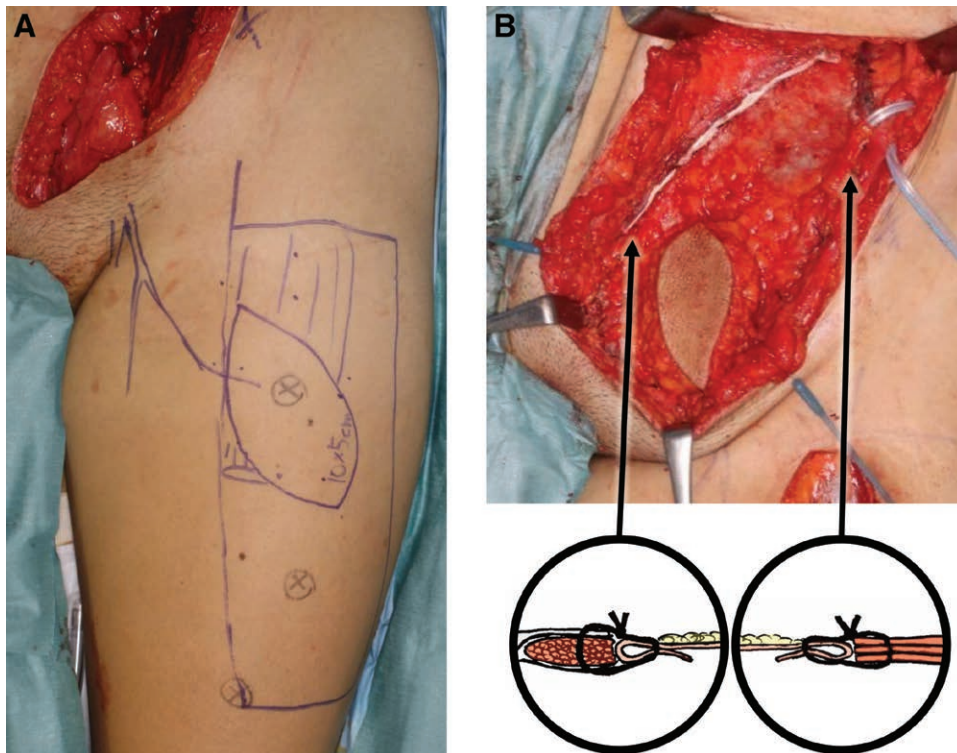


Fig. 1. Intraoperative appearance of the case 1 operation. The case 2 operation was performed in the same way except that the flap was transferred as free flap. A, The flap design of the ALT + ITT flap in the left thigh. The ALT flap was harvested combined with the ITT and upper fat layer. B, The completion of abdominal wall reconstruction. The flap was transposed to the abdominal defect through the route under the rectus femoris and sartorius muscles as a pedicled flap. The vascularized ITT with thigh fat was double-folded at the edge and sutured tightly to the stump of the full layer of the abdominal wall (lateral side: external/internal oblique muscle, transversus abdominis muscle.; medial side: rectus abdominis muscle and sheath). The skin island of the flap was deepithelialized with the exception of the small monitoring flap.

abdominal wall hernia or bulging after the delivery (See figure, Supplemental Digital Content 1 which displays postoperative appearance of the surgical site and MRI. B: Case 2 (41 months after the operation and at 19 months after delivery). <http://links.lww.com/PRSGO/A788>).

DISCUSSION

Neither of the 2 patients in the present study experienced severe pain during pregnancy, which has sometimes been reported when synthetic mesh is used in abdominal wall reconstruction.¹⁻³ This is probably due to the affinity and extensibility of the ITT graft. On the other hand, the mechanical strength of the ITT is usually lower than that of synthetic mesh; nevertheless, it is noteworthy that neither of the 2 patients developed hernia or bulging after delivery. However, in the present 2 cases the abdominal wall defects of the lateral oblique muscle area were relatively small, which might have had a favorable effect with regard to the absence of hernia and bulging. Further evidence should be accumulated on the reconstruction of wider and central abdominal wall defects.

With the exception of a report on 1 case in which reconstruction was performed using a tensor fascia lata (TFL) flap,⁴ there have been no reports on pregnancy after the autologous reconstruction of the abdominal wall. The ALT + ITT flap is now a widely accepted choice for abdominal wall reconstruction.⁵⁻⁷ ALT + ITT and TFL flaps are essentially the same flaps; however, they are nourished by different vascular pedicles. The main advantages of the ALT + ITT flap over the TFL flap include the longer vascular pedicle and wider coverage.⁵ To the best of our knowledge, the present report is the first to describe a successful pregnancy and delivery after abdominal wall reconstruction with an ALT + ITT flap.

Desmoid tumor is a rare tumor of borderline malignancy that is prevalent in young women of childbearing age, and it is associated with a high risk of progression during pregnancy.⁸⁻¹⁰ The managements of desmoid tumor include a conservative watchful waiting approach, primary radical resection, radiation therapy, and systemic treatments, including chemotherapy.^{8,10} Given that patients who undergo abdominal wall reconstruction can tolerate pregnancy and delivery with few complications, it is reasonable to choose primary radical resection of abdominal-wall desmoid tumor when a woman indicates that she wishes to have children in the future.

CONCLUSIONS

Normal pregnancy and full-term delivery could be obtained after abdominal wall resection and autologous reconstruction using an ALT + ITT flap. This reconstructive method is considered to be a versatile option for the management of abdominal wall tumor in women with childbearing potential; however, further evidence should be accumulated on the reconstruction of wider and central abdominal wall defects.

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REFERENCES

1. Aaen V, Cowan L, Sakala EP, et al. Prolonged parenteral meperidine analgesia during pregnancy for pain from an abdominal wall mesh graft. *Obstet Gynecol.* 1993;82:721-722.
2. Mulder RJ, Stroobants WL, Roumen FJ. Pregnancy and delivery with an abdominal mesh graft. *Eur J Obstet Gynecol Reprod Biol.* 2004;116:235-236.
3. Jensen KK, Henriksen NA, Jorgensen LN. Abdominal wall hernia and pregnancy: a systematic review. *Hernia.* 2015;19:689-696.
4. Sowa Y, Nishino K, Fujiwara T, et al. Normal transvaginal delivery after abdominal wall reconstruction with tensor fascia lata muscle flap. *Ann Plast Surg.* 2009;62:80-82.
5. Kimata Y, Uchiyama K, Sekido M, et al. Anterolateral thigh flap for abdominal wall reconstruction. *Plast Reconstr Surg.* 1999;103:1191-1197.
6. Kayano S, Sakuraba M, Miyamoto S, et al. Comparison of pedicled and free anterolateral thigh flaps for reconstruction of complex defects of the abdominal wall: review of 20 consecutive cases. *J Plast Reconstr Aesthet Surg.* 2012;65:1525-1529.
7. Lv Y, Cao D, Guo F, et al. Abdominal wall reconstruction using a combination of free tensor fasciae lata and anterolateral thigh myocutaneous flap: a prospective study in 16 patients. *Am J Surg.* 2015;210:365-373.
8. Fiore M, Coppola S, Cannell AJ, et al. Desmoid-type fibromatosis and pregnancy: a multi-institutional analysis of recurrence and obstetric risk. *Ann Surg.* 2014;259:973-978.
9. Yabanoglu H, Karagulle E, Aytac HO, et al. Results of surgical treatment of anterior abdominal wall desmoid tumours: 13 cases reviewed with literature. *Acta Chir Belg.* 2014;114:393-399.
10. Penel N, Chibon F, Salas S. Adult desmoid tumors: biology, management and ongoing trials. *Curr Opin Oncol.* 2017;29:268-274.