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Reconstruction of a large abdominal wall defect without using mesh: A case report

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ABSTRACT

INTRODUCTION: Reconstruction of the abdominal wall supplemented by surgery of the abdominal wall infection or the excision of the abdominal wall tumor is one of the most difficult procedures due to the need to avoid incisional hernia and to minimize the spread of infection. The primary purpose of the repair of the abdominal wall is to safeguard the visceral organs and avoid postoperative incisional hernia. Many of the abdominal wall restoration procedures include simple sutures of rectus abdominis aponeurosis, component separation procedure, and open mesh repair. Mesh restoration is currently the gold standard in elective care for most instances of abdominal wall reconstruction.

PRESENTATION OF CASE: A male patient aged 69 years had cutaneous mucormycosis. We agreed to perform a wide excision of the lesion. There was a large abdominal wall defect after the excision. Due to concerns about mesh repair due to contaminated surgical area and loss of skin shielding, we opted to use Nylon Darn for abdominal closure.

DISCUSSION: We documented our technique for abdominal wall reconstruction using adapted Nylon darn. **CONCLUSION:** For closing abdominal wall defects in surgical areas with elevated infection rates, the newly-designed technique proposed in this paper could be an alternative approach.

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1. Introduction

Reconstruction of the abdominal wall accompanied by surgery of the abdominal wall infection or the excision of the abdominal wall tumor is one of the most difficult procedures due to the need to avoid incisional hernia and to minimize the spread of infection. Securing the visceral organs and avoiding postoperative incisional hernia are the primary purposes for the restoration of the abdominal wall [1]. Many abdominal wall repair procedures involve simple sutures of rectus abdominis aponeurosis, culminating in recurrent rates as high as 54%. Using the component separation approach for mesh is an unnecessarily complicated operation and involves high skin flaps necrosis at 20%, as found in a study by Ramirez [2]. Open-mesh repair had a low recurrence rate compared to simple sutures (32% vs. 63%), as found by Jacobus et al. [3]. Open mesh repair may also result in high incidence rates. At present, however, mesh repair is still the gold standard for elective treatment in most abdominal wall reconstruction operations.

We describe our technique for abdominal wall reconstruction using modified Nylon darn repair applied from the studies of Loh et al. [4], Johnson et al. [5], and Igwe et al. [6], and our technique for inguinal hernia repair [7], due to the high infection rates for

mesh repair, in our patient diagnosed cutaneous mucormycosis as an active infection area.

This project has been described according to SCARE criteria [8].

2. Case report

A male patient of Thai descent, 69 years of age, (weight 45 kg, height 160 cm, BMI 17.58 kg/m²), with underlying TB pleura (completed care for 6 years), had a chronic abdominal wound that had been present for 18 months. Approximately 18 months ago, the patient acquired a lower abdominal lesion, as seen in Fig. 1, and was sent for CT scan of the abdominal region. A 1.6 × 6.5 × 4.2 cm ill-defined enhancing subcutaneous mass on the right lower abdominal wall with no demonstrable intra-abdominal abnormality was identified using the scans. Subsequently, the patient's lesion was biopsied by an internist at a rural hospital, which showed chronic granulomatous inflammation that was treated as TB skin by 2IRZE/4IR for 6 months. However, the lesion did not improve. Thus, the internist decided to modify the treatment for non-tuberculous mycobacteria with permutations of clarithromycin, ethambutol, and rifampicin. The next year, the lesion still hadn't improved, so the internist resolved to refer the patient to our hospital for consultation with a surgeon about the chronic abdominal wound. The patient reported having no drug allergies or family history of genetic disease.

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Fig. 1. Patient's wound and resected line.

A 20 cm ulcerative lesion at the lower abdominal wall that had partially invaded the rectus abdominis aponeurosis comprised the patient's lesion. Wide excision of the patient's lesion was performed by a skilled general surgeon (7 years-experienced) and the tissue was sent for pathological analysis, which revealed an ulcer with multiple foci of chronic granulomatous inflammation and with scattered central necrosis, as well as a board non-septated hyphae with right-angle branching in the subcutaneous adipose tissue. A diagnosis of cutaneous mucormycosis was established and an infectious disease sub-specialist was contacted, but it was determined not to provide the patient any antifungal treatment.

As shown in Fig. 2, there was a rectus abdominis aponeurosis defect sized 20 × 20 cm identified after the operation. We opted not to use synthetic mesh to shield the defect because it was an active contaminated region with a high chance of mesh contamination. In addition, the patient did not have enough skin or subcutaneous tissue to protect the mesh by component separation technique. Therefore, we agreed to add the Darning Nylon Loop No. 1 patch to the closure of the rectus abdominis aponeurosis defect, as seen in Fig. 3, and to begin the wet dressing until the granulation tissue covered the entire defect, as shown in Figs. 4 and 5. The patient was encouraged to dress the wound at least once daily and to do no heavy physical exercise or weight lifting until the wound had healed. The patient was followed at the outpatient department every month. The patient was expected to undergo a split-thickness grafting of the skin 3 months later, as seen in Fig. 6, with follow-up at 1 year without incisional hernia. The patient did well and showed agreement with the result.

3. Discussion

Reconstruction of the abdominal wall accompanied by surgery of the abdominal wall infection or the excision of the abdominal wall tumor is one of the most difficult procedures due to the need to avoid incisional hernia and to minimize the spread of infection. Securing the visceral organs and avoiding postoperative incisional hernia are the primary goals of the restoration of the abdominal wall [1]. A number of abdominal wall reconstruction procedures have been reported, such as simple sutures of the rectus abdominis aponeurosis, which culminated in complication rates as high as 54%. Ramirez's analysis using the component isolation technique found that mesh repair is an overly complex procedure causing elevated skin flap necrosis at 20% [2]. Jacobus et al. reported results

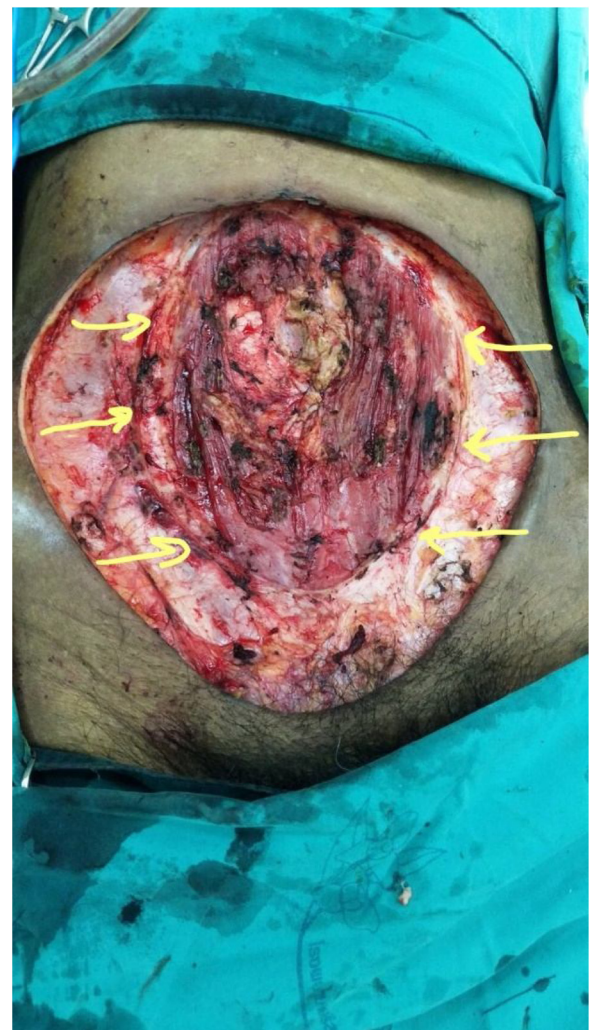


Fig. 2. Rectus abdominis aponeurosis defect (arrow).

that open mesh repair has a low recurrence risk relative to simple sutures (32% vs. 63%) [3]. Still, open mesh repair possesses high recurrence rates. Mesh restoration is currently the gold standard

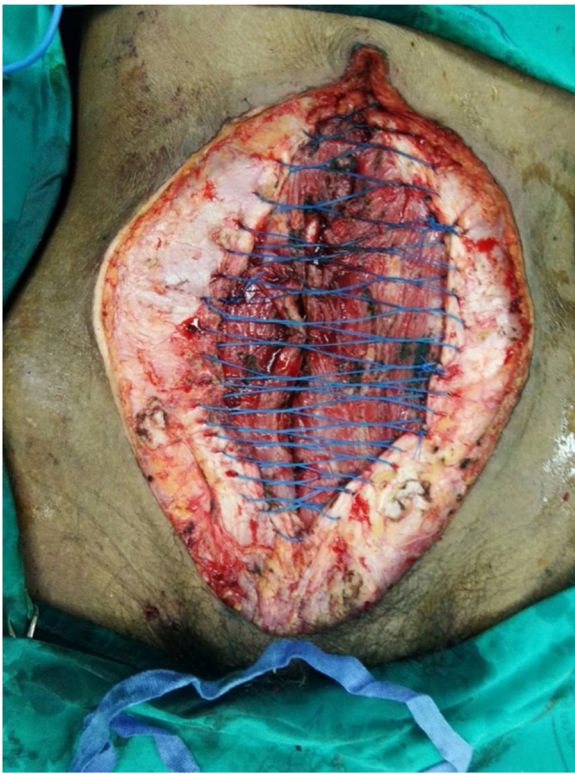


Fig. 3. After nylon darn repair.



Fig. 4. 1 month after operation.

for elective treatment of most abdominal wall reconstruction procedures. For our patient with active contaminated surgical area and with insufficient skin and subcutaneous tissue covering, we elected to not use synthetic mesh graft to address the abdominal wall defect due to mesh exposure without skin shielding. Instead, we employed the approach reported by Loh et al. [4], Johnson et al. [5], and Igwe et al. [6] and our procedure for inguinal hernia repair [7] using Nylon darn repair with Nylon loop no. 1 for closure of the abdominal wall defect. In order to avoid further intestinal herniation and facil-

itate wound granulation before complete granulation, the patient was expected to have a split thickness of the skin graft. Our worry is about the distance of nylon darn-meshed size that could not be preventing the intestinal herniation. Nevertheless, in the followed period, the patient showed no signs of incisional hernia after 1 year of follow-up and had been treated without any difficulties. Further-



Fig. 5. 2 months after operation.



Fig. 6. After split thickness skin graft.

more, we need more long term followed period for the presence or absence of the incisional hernia.

4. Conclusion

For closing abdominal wall defects in surgical areas with elevated infection rates, the newly-designed technique proposed in this paper could be an alternative approach.

Declaration of Competing Interest

The authors report no declarations of interest.

Sources of funding

No source of funding.

Ethical approval

This study was approved by the Institutional Review Board of Sisaket Hospital (SSKH REC No. 034/2563).

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy

of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Apinan Rongviriyapanich, M.D. – all process.

Registration of research studies

1. Name of the registry: Large abdominal wall defect reconstruction without using the mesh: A case report.
2. Unique identifying number or registration ID: researchregistry5881.
3. Hyperlink to your specific registration (must be publicly accessible and will be checked): <https://www.researchregistry.com/register-now#user-researchregistry/registerresearchdetails/5f2cbdd8157b1000159ed695/>.

Guarantor

Apinan Rongviriyapanich.

Provenance and peer review

Not commissioned, externally peer-reviewed.

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Written informed consent for dissemination of this case study and accompanying imagery was received from the patient prior to release. Upon request, a copy of the prior consent is publicly available by the Editor-in-Chief of this journal.

This project was approved by the Institutional Review Board of our hospital.

References

- [1] A.F. Mericli, D.P. Baumann, C.E. Butler, Reconstruction of the abdominal wall after oncologic resection: defect classification and management strategies, *Plast. Reconstr. Surg.* 142 (2018) 187S–196S.
- [2] L. Heller, C.H. McNichols, O.M. Ramirez, Component separations, *Semin. Plast. Surg.* 26 (2012) 25–28.
- [3] J.W. Burger, R.W. Luijendijk, W.C. Hop, J.A. Halm, E.G. Verdaasdonk, J. Jeekel, Long-term follow-up of a randomized controlled trial of suture versus mesh repair of incisional hernia, *Ann. Surg.* 240 (2004) 578–585.
- [4] A. Loh, J.S. Rajkumar, L.M. South, Anatomical repair of large incisional hernias, *Ann. R. Coll. Surg. Engl.* 74 (2) (1992) 100–105.
- [5] D. Johnson, D.H. Harrison, A technique for repairing massive ventral incisional hernias without the use of a mesh, *Br. J. Plast. Surg.* 52 (5) (1999) 399–403.
- [6] P.O. Igwe, N.A. Ibrahim, Strangulated sliding Spigelian hernia: a case report, *Int. J. Surg. Case Rep.* 53 (2018) 475–478.
- [7] A. Rongviriyapanich, Moloney's darn repair versus Lichtenstein repair in Bang Phli hospital, *J. Depart. Med. Serv.* 5 (2017) 49–52.
- [8] R.A. Agha, M.R. Borrelli, R. Farwana, K. Koshy, A. Fowler, D.P. Orgill, For the SCARE Group, The SCARE 2018 statement: updating consensus Surgical Case Report (SCARE) guidelines, *Int. J. Surg.* 60 (2018) 132–136.

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