Usefulness of three-dimensional computed tomography reconstruction of incisional hernia for planning laparoscopic hernia repair

Hiroto Kayashima, Takashi Maeda, Noboru Harada, Teruyoshi Ishida

ABSTRACT

Abstract is not required for Clinical Images

International Journal of Case Reports and Images (IJCRI)

International Journal of Case Reports and Images (IJCRI) is an international, peer reviewed, monthly, open access, online journal, publishing high-quality, articles in all areas of basic medical sciences and clinical specialties.

Aim of IJCRI is to encourage the publication of new information by providing a platform for reporting of unique, unusual and rare cases which enhance understanding of disease process, its diagnosis, management and clinico-pathologic correlations.

IJCRI publishes Review Articles, Case Series, Case Reports, Case in Images, Clinical Images and Letters to Editor.

Website: www.ijcasereportsandimages.com

CLINICAL IMAGES

PEER REVIEWED | OPEN ACCESS

Usefulness of three-dimensional computed tomography reconstruction of incisional hernia for planning laparoscopic hernia repair

Hiroto Kayashima, Takashi Maeda, Noboru Harada, Teruyoshi Ishida

CASE REPORT

We report on two incisional hernia's cases in which preoperative three-dimensional computed tomography (3D-CT) reconstruction images were very useful for planning their laparoscopic surgeries. Patient 1 was a 78-year-old male who had been performed partial hepatectomy for hepatocellular carcinoma with J-shaped incision two years before and developed a midline incisional hernia. The preoperative 3D-CT using SYNAPSE VINCENT (Fuji Photo Film Co. Ltd., Tokyo, Japan) showed the defect measuring 4.3×2.9 cm (Figure 1A). The laparoscopic incisional hernia repair was performed. Intraoperative hernia size was 4.3 × 2.8 cm. We repaired the defect with 12.0×12.0 cm Parietex™ Optimized Composite Mesh (Nippon Covidien Inc., Tokyo, Japan). The patient tolerated the procedure well with no complication. Patient 2 was a 64-year-old male who had received central bisegmentectomy for hepatocellular carcinoma two years before and presented with a large incisional hernia of the lateral aspect of the right subcostal incision, and the content of hernia was almost intestines. The hernia size was 14.8×12.9 cm measuring by the preoperative 3D-CT (Figure 1B) and the actual intraoperative hernia size was 15.0×13.0 cm. We performed a laparoscopic incisional hernia repair with

20.0×15.0 cm Parietex™ Optimized Composite Mesh and the patient was discharged without any complication and hernia recurrence is not occurred at this time.

Figure 1: The three-dimensional computed tomography reconstruction images of the incisional hernias. (A) The image showing the midline incisional hernia of Patient 1 (Black arrows). (B) The image showing the right subcostal incisional hernia of Patient 2 (Black arrows). The content was almost intestines.

DISCUSSION

Incisional hernia is a frequent complication of laparotomy that occurs in up to 11% of surgical abdominal wounds and in up to 20% of patients who develop postoperative wound infections [1]. Since the first report in 1993, laparoscopic incisional hernia repair has led to improved results with a low recurrence rate of 4.2%, with an impressive conversion rate of only 2.4%, and enterotomy rate of 1.8% [2]. Recent report about the comparison between laparoscopic and open incisional hernia repair demonstrated that the incidences of wound infection (2.8% versus 16.2%) and the rates of wound drainage (2.6% versus 67.0%) were significantly lower in the laparoscopic group and there were no significant differences in the incidences of hernia recurrence, postoperative seroma, hematoma, bowel obstruction, bleeding, and reoperation [3]. Laparoscopic approach of incisional hernia repair is based on two technical principles: a hernia gate that is not closed and the proper sized mesh placed intraperitoneally. Therefore, accurate

Hiroto Kayashima¹, Takashi Maeda¹, Noboru Harada¹, Teruyoshi Ishida¹

Affiliations: ¹MD, Ph.D, Department of Surgery, Hiroshima Red Cross Hospital and Atomic Bomb Hospital, 1-9-6 Senda-cho, Naka-ku, Hiroshima 730-8619, Japan.

Corresponding Author: Hiroto Kayashima, MD, PhD, Department of Surgery, Hiroshima Red Cross Hospital and Atomic Bomb Hospital, 1-9-6 Senda-cho, Naka-ku, Hiroshima 730-8619, Japan; Ph: +81-082-241-3111, Fax: +81-082-246-0676; Email: hkaya@surg2.med.kyushu-u.ac.jp

Received: 30 October 2014

Accepted: 12 December 2014

Published: 01 March 2015

measurement of hernia size is important for preoperative choice of patch size. Some papers reported that 3D-CT reconstruction could identify abdominal wall defects and hernia contents more clearly compared with plain CT scans, and that diagnosis of hernia was easy based on 3D-CT [4]. Recent 3D-CT reconstruction software represents a marked improvement and is capable of displaying 3D-CT images within a few minutes using a single click. In fact, the 3D-CT images of our two cases could clearly display abdominal wall defects and directly obtain hernia sizes in a short time. Briefly, 3D-CT reconstruction images are more useful to display abdominal wall defects, to know if the hernia gate is not closed, and to obtain hernia size than ordinary CT. There is a general consensus on the patch size that extends 3 cm or 5 cm beyond the edges of hernia, therefore, we chose 12.0×12.0 cm mesh for Patient 1. In subcostal incisional hernias, it had been reported that the close proximity to the xiphoid process and the costochondral structures hindered adequate coverage of the defect, and the role of laparoscopic approach was still controversial because of its low prevalence, however, recent reports described that the laparoscopic approach was a safe and effective treatment for non-midline incisional hernias [5]. Therefore, the large right subcostal incisional hernia of Patient 2 was repaired by laparoscopic approach using 20.0×15.0 cm mesh. Although the patient was discharged without any complications, there is a need for a careful follow-up.

CONCLUSION

Three-dimensional computed tomography reconstruction of incisional hernia can be displayed within a few minutes and calculate the hernia size with considerable accuracy. It is of great use for planning the laparoscopic approach for incisional hernia repair.

How to cite this article

Kayashima H, Maeda T, Harada N, Ishida T. Usefulness of three-dimensional computed tomography reconstruction of incisional hernia for planning laparoscopic hernia repair. *Int J Case Rep Images* 2015;6(3):181–183.

doi:10.5348/ijcri-201509-CL-10064

Author Contributions

Hiroto Kayashima – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Takeshi Maeda – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published
Noboru Harada – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published
Teruyoshi Ishida – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

Copyright

© 2015 Hiroto Kayashima et al. This article is distributed under the terms of Creative Commons Attribution License which permits unrestricted use, distribution and reproduction in any medium provided the original author(s) and original publisher are properly credited. Please see the copyright policy on the journal website for more information.

REFERENCES

1. Mudge M, Hughes LE. Incisional hernia: A 10 year prospective study of incidence and attitudes. *Br J Surg* 1985 Jan;72(1):70–1.
2. LeBlanc KA. Incisional hernia repair: Laparoscopic techniques. *World J Surg* 2005 Aug;29(8):1073–9.
3. Zhang Y, Zhou H, Chai Y, Cao C, Jin K, Hu Z. Laparoscopic versus open incisional and ventral hernia repair: A systematic review and meta-analysis. *World J Surg* 2014 Sep;38(9):2233–40.
4. Yao S, Li JY, Liu FD, Pei LJ. Significance of measurements of herniary area and volume and abdominal cavity volume in the treatment of incisional hernia: Application of CT 3D reconstruction in 17 cases. *Comput Aided Surg* 2012;17(1):40–5.
5. Moreno-Egea A, Carrillo-Alcaraz A. Management of non-midline incisional hernia by the laparoscopic approach: Results of a long-term follow-up prospective study. *Surg Endosc* 2012 Apr;26(4):1069–78.

Access full text article on
other devices

Access PDF of article on
other devices

Edorium Journals: An introduction

Edorium Journals Team

About Edorium Journals

Edorium Journals is a publisher of high-quality, open access, international scholarly journals covering subjects in basic sciences and clinical specialties and subspecialties.

Invitation for article submission

We sincerely invite you to submit your valuable research for publication to Edorium Journals.

But why should you publish with Edorium Journals?

In less than 10 words - we give you what no one does.

Vision of being the best

We have the vision of making our journals the best and the most authoritative journals in their respective specialties. We are working towards this goal every day of every week of every month of every year.

Exceptional services

We care for you, your work and your time. Our efficient, personalized and courteous services are a testimony to this.

Editorial Review

All manuscripts submitted to Edorium Journals undergo pre-processing review, first editorial review, peer review, second editorial review and finally third editorial review.

Peer Review

All manuscripts submitted to Edorium Journals undergo anonymous, double-blind, external peer review.

Early View version

Early View version of your manuscript will be published in the journal within 72 hours of final acceptance.

Manuscript status

From submission to publication of your article you will get regular updates (minimum six times) about status of your manuscripts directly in your email.

Our Commitment

Six weeks

You will get first decision on your manuscript within six weeks (42 days) of submission. If we fail to honor this by even one day, we will publish your manuscript free of charge.

Four weeks

After we receive page proofs, your manuscript will be published in the journal within four weeks (31 days). If we fail to honor this by even one day, we will publish your manuscript free of charge and refund you the full article publication charges you paid for your manuscript.

Mentored Review Articles (MRA)

Our academic program "Mentored Review Article" (MRA) gives you a unique opportunity to publish papers under mentorship of international faculty. These articles are published free of charges.

Favored Author program

One email is all it takes to become our favored author. You will not only get fee waivers but also get information and insights about scholarly publishing.

Institutional Membership program

Join our Institutional Memberships program and help scholars from your institute make their research accessible to all and save thousands of dollars in fees make their research accessible to all.

Our presence

We have some of the best designed publication formats. Our websites are very user friendly and enable you to do your work very easily with no hassle.

Something more...

We request you to have a look at our website to know more about us and our services.

We welcome you to interact with us, share with us, join us and of course publish with us.

Edorium Journals: On Web

Browse Journals

CONNECT WITH US