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CASE REPORT

Three-dimensional computed tomography reconstruction diagnosed digestive tract perforation and acute peritonitis caused by *Monopterus albus*: A case report

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Abstract

BACKGROUND

Few reports have described living foreign bodies in the human body. The current manuscript demonstrates that computed tomography (CT) is an effective tool for accurate preoperative evaluation of living foreign bodies in clinic. The three-dimensional (3D) reconstruction technology could clearly display anatomical structures, lesions and adjacent organs, improving diagnostic accuracy and guiding the surgical decision-making process.

CASE SUMMARY

Herein we describe a 68-year-old man diagnosed with digestive tract perforation and acute peritonitis caused by a foreign body of *Monopterus albus*. The patient pre-sented to the emergency department with complaints of dull abdominal pain, profuse sweating and a pale complexion during work. A *Monopterus albus* had entered the patient's body through the anus two hours ago. During hospitalization, the 3D reconstruction technology revealed a perforation of the middle rectum complicated with acute peritonitis and showed a clear and complete *Monopterus albus* bone morphology in the abdominal and pelvic cavities, with the *Monopterus albus* biting the mesentery. Laparoscopic examination detected a large (diameter of about 1.5 cm) perforation in the mid-rectum. It could be seen that a *Monopterus albus* had completely entered the abdominal cavity and had tightly bitten the mesentery of the small intestine. During the operation, the dead *Monopterus albus* was taken out.

CONCLUSION

The current manuscript demonstrates that CT is an effective tool for accurate preoperative evaluation of living foreign bodies in clinic.

Key Words: Digestive tract perforation; Acute peritonitis; *Monopterus albus*; Three-dimensional computed tomography reconstruction; Case report

Core Tip: Computed tomography (CT) is an effective tool for accurate preoperative evaluation of living foreign bodies in the human body. Three-dimensional (3D) CT reconstruction could clearly display anatomical structures, lesions and adjacent organs, improving diagnostic accuracy. In the present case, preoperative 3D CT reconstruction accurately showed a foreign body located outside the intestinal cavity with a perforation site, and revealed that the foreign body had damaged the mesentery in the small intestine, causing fluid and gas accumulation, as well as peritoneal thickening. These findings indicate preoperative 3D CT reconstruction may accurately locate perforation sites and foreign bodies, help diagnose peritonitis and guide surgical treatment.

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INTRODUCTION

Digestive tract perforation is a common acute abdominal pathology[1,2], often secondary to ulcers, trauma, inflammation, tumors, *etc*. Computed tomography (CT) constitutes an effective tool for accurate preoperative evaluation of foreign bodies in clinic[3]. Preoperative three-dimensional (3D) CT reconstruction accurately locates perforation sites and foreign bodies, helps diagnose peritonitis and guides surgical treatment[4]. In the present case, according to clinical symptoms and signs, combined with plain 3D CT reconstruction, it was determined that the patient had digestive tract perforation, and a *Monopterus albus* had died after entering the abdominal cavity[5]. As a result, the patient's abdominal cavity was seriously polluted, with a large amount of turbid yellow fluid and a small amount of feces attached to several intestinal areas, so it could be determined that the patient had "intestinal perforation" caused by a *Monopterus albus*[6]. The intestinal wall is relatively weak, and may burst out after *Monopterus albus* bites, which easily causes acute diffuse peritonitis [7]. If not timely treated, patients may develop septic shock, which is a serious and life-threatening condition. Surgical removal of foreign bodies, *e.g.*, *Monopterus albus*, is the best treatment method, and preoperative imaging evaluation is particularly important[8]. Living foreign bodies are rarely reported in the literature.

CASE PRESENTATION

Chief complaints

One patient, a 68-year-old man from China, presented to the hospital's emergency department after suffering from dull abdominal pain, profuse sweating and a pale complexion during the two-hour workday.

History of present illness

Symptoms started 2 h before presentation with complaints of dull abdominal pain, profuse sweating and a pale complexion during work.

History of past illness

The patient didn't have any remarkable history.

Personal and family history

The patient denied having a family history of any malignant tumors.

Physical examination

Using a physical examination, the results showed the following vital signs: Blood pressure, 118/69 mmHg; body temperature, 36.4 °C; heart rate, 81 beats/min; respiratory frequency, 18 breaths/min. Furthermore, total abdominal tenderness, plate-like abdomen, and liver dullness disappeared, with weak abdominal breathing and bowel sounds.

Table 1 Laboratory data at admission

Parameter	Value (admission)	Reference value	Unit
N-terminal-pro B-type natriuretic peptide	80	0-125	pg/mL
Urea	3.7	2.5-6.1	mmol/L
Creatinine	58	46-92	μmol/L
Troponin	< 0.01	0-0.04	ng/mL
Myoglobin	111.1	0-120	ng/mL
Carcinoembryonic antigen	4.5	0-5.0	ng/mL
Carbohydrate antigen 19-9	< 3	0-27	U/mL
Alpha-fetoprotein	3.2	0-7.000	ng/mL
Creatine kinase	102.2	30-135	U/L
Creatine kinase MB isoenzyme	11.3	0-16	U/L
Lactic dehydrogenase	145.88	120-246	U/L
D-dimer	0.28	0-0.5	μg/mL
White blood cell	9.10	4-10	10^9/L
Platelet	140	125-350	10^9/L
Hemoglobin	119	110-150	g/L
Alanine aminotransferase	18.28	5-40	IU/L
Aspartate aminotransferase	15.44	8-40	IU/L
Total bilirubin	16.48	5-21	μmol/L
Direct bilirubin	3.26	0-3.4	μmol/L
Indirect bilirubin	13.12	1.6-21	μmol/L
Albumin	42.73	35-52	g/L
Total cholesterol	3.67	3.0-5.7	mmol/L
Low density lipoprotein cholesterol	3.65	< 4.13	mmol/L
High density lipoprotein cholesterol	1.86	1.29-1.55	mmol/L
Fasting blood glucose	4.44	3.9-6.1	Mmol/L
Urinary protein	negative	negative	-
Hepatitis B surface antigen	0	< 0.05	IU/mL
Antibody to hepatitis C	6.04	< 1	S/CO
Immunodeficiency virus antigen and antibody	0.09	< 1	S/CO
Antibody to treponema pallidum	0.07	< 1	S/CO
Hepatitis C virus RNA	0	0	IU/mL
Anti-nuclear antibodies	negative	negative	-
Anti-cyclic citrullinated peptide antibody	13.89	< 25	RU/mL
Anti-cardiolipin antibody	2.23	0-12	RU/mL
Blood ammonia	22	9-30	μmol/L
Erythrocyte sedimentation rate	15	0-20	mm/h

Laboratory examinations

Laboratory tests showed normal liver function, alpha-fetoprotein, carbohydrate antigen 19-9, and carcinoembryonic antigen. No abnormality was found in routine blood and urine analyses. Primary laboratory data upon admission are summarized in Table 1.

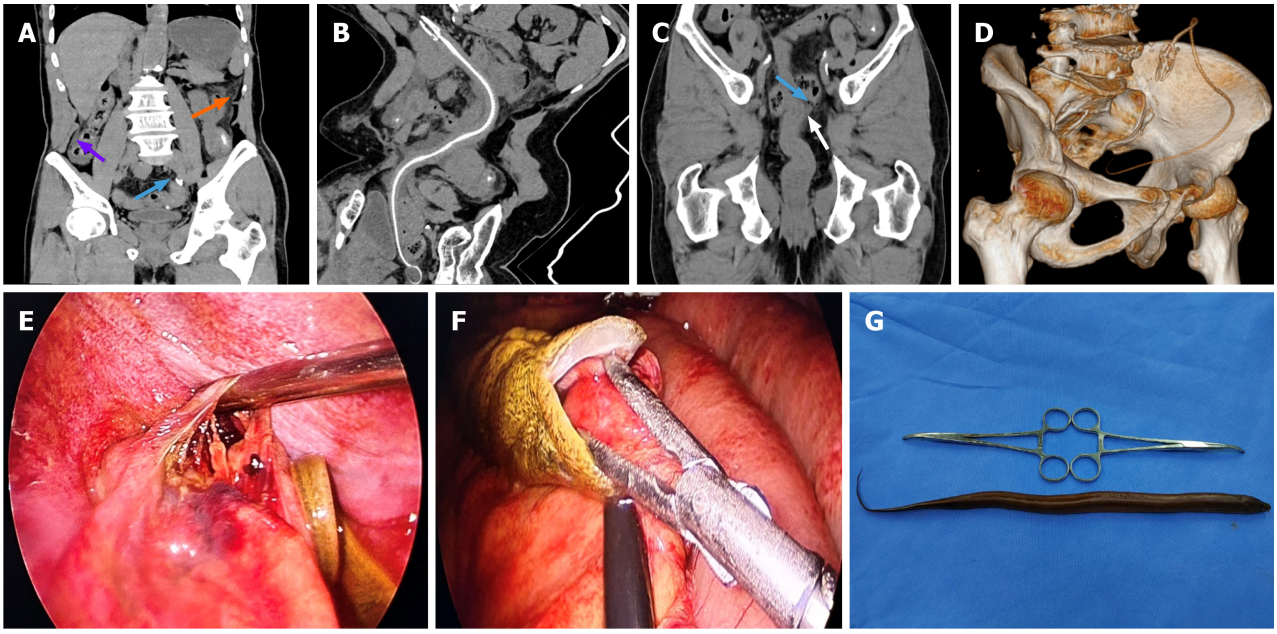

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Figure 1 Imaging and laparoscopic exploration. A: Computed tomography (CT) with multi-plane reconstruction revealed scattered exudation, peritoneal thickening (orange arrow), peritoneal effusion (purple arrow), and free gas (blue arrow) in the abdominal cavity, suggesting gastrointestinal perforation complicated with acute peritonitis; B: Curved planar reconstruction (CPR) of CT images showed an abdominal *Monopterus albus* that has bitten the mesentery, indicating a foreign body outside the intestinal cavity; C: CPR of CT images revealed rough and raised outer margin of the wall of the mid-rectum (white arrow), as well as exudation and free gas in the surrounding mesentery (blue arrow), indicating a perforation in the mid-rectum; D: Volume reconstruction revealed clear and complete *Monopterus albus* bone morphology in the abdominal and pelvic cavities; E: Laparoscopic exploration revealed a large perforation in the mid-rectum, with a diameter approximating 1.5 cm; F: Laparoscopic exploration showed the *Monopterus albus* has perforated the mesentery of the small intestine; G: During the operation, the dead *Monopterus albus* was taken out, with a length of about 40 cm.

Imaging examinations

CT with multi-plane reconstruction revealed scattered exudation, effusion and free gas in the abdominal cavity, indicating gastrointestinal perforation complicated with acute peritonitis (Figure 1A). Curved planar reconstruction of CT images revealed an abdominal *Monopterus albus* biting the mesentery, suggesting a *Monopterus albus* outside the intestinal cavity (Figure 1B). The outer margin of wall of the mid-rectum was rough and raised, and exudation and free gas were detected in the surrounding mesentery, suggesting a perforation of the mid-rectum (Figure 1C). Volume reconstruction of CT images showed clear and complete eel bone morphology in the abdominal and pelvic cavities (Figure 1D).

Further diagnostic work-up

The patient consented to laparoscopic surgery. Laparoscopic exploration revealed abundant cloudy yellow fluid and small amounts of feces-like fluid in the abdominal and pelvic cavities, and a large perforation was detected in the mid-rectum, with a diameter approximating 1.5 cm (Figure 1E), alongside a small amount of stool. It could be observed that the *Monopterus albus* has completely entered the abdominal cavity and has tightly bitten the mesentery of the small intestine (Figure 1F). During the operation, the dead *Monopterus albus* was extracted, and was about 40 cm long (Figure 1G).

FINAL DIAGNOSIS

Based on the patient's previous medical history, the patient was eventually diagnosed with digestive tract perforation and acute peritonitis.

TREATMENT

Postoperatively, the patient recovered well and was discharged on postoperative 5 d.

OUTCOME AND FOLLOW-UP

The patient recovered without complications.

DISCUSSION

Few reports have described living foreign bodies in the human body[9]. CT constitutes an effective tool for accurate preoperative evaluation of living foreign bodies in clinic[3]. 3D CT reconstruction clearly displays anatomical structures, lesions and adjacent organs, improving diagnostic accuracy[6]. In the present case, preoperative 3D CT reconstruction accurately located a *Monopterus albus* outside the intestinal cavity with a perforation site, and the foreign body had damaged the mesentery in the small intestine, causing fluid and gas accumulation, as well as peritoneal thickening[5]. These findings suggest preoperative 3D CT reconstruction may accurately locate perforation sites and foreign bodies, help diagnose peritonitis and guide surgical treatment[4].

CONCLUSION

Preoperative 3D CT reconstruction can accurately locate perforation sites and living foreign bodies, help diagnose peritonitis and guide surgical treatment.

FOOTNOTES

Author contributions: Yang JH and Lan JY contributed to manuscript writing and editing, as well as data collection; Lin AY and Huang WB contributed to data analysis; Liao JY contributed to conceptualization and supervision; and all authors have read and approved the final manuscript.

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REFERENCES

1 **Chen P**, Gao J, Li J, Yu R, Wang L, Xue F, Zheng X, Gao L, Shang X. Construction and efficacy evaluation of an early warning scoring system for septic shock in patients with digestive tract perforation: A retrospective cohort study. *Front Med (Lausanne)* 2022; **9**: 976963 [PMID: 36177334 DOI: 10.3389/fmed.2022.976963]

2 **Hajibandeh S**, Shah J, Hajibandeh S, Murali S, Stephanos M, Ibrahim S, Asqalan A, Mithany R, Wickramasekara N, Mansour M. Intraperitoneal contamination index (Hajibandeh index) predicts nature of peritoneal contamination and risk of postoperative mortality in patients with acute abdominal pathology: a prospective multicentre cohort study. *Int J Colorectal Dis* 2021; **36**: 1023-1031 [PMID: 33409563 DOI: 10.1007/s00384-020-03822-5]

3 **Kang J**, Jiang L. Application Value of the CT Scan 3D Reconstruction Technique in Maxillofacial Fracture Patients. *Evid Based Complement Alternat Med* 2022; **2022**: 1643434 [PMID: 35845575 DOI: 10.1155/2022/1643434]

4 **Lee CM**, Liu RW. Comparison of pelvic incidence measurement using lateral x-ray, standard ct versus ct with 3d reconstruction. *Eur Spine J* 2022; **31**: 241-247 [PMID: 34743245 DOI: 10.1007/s00586-021-07024-7]

5 **Kathayat LB**, Chalise A, Maharjan JS, Bajracharya J, Shrestha R. Intestinal Perforation with Ingestion of Blunt Foreign Bodies: A Case Report. *JNMA J Nepal Med Assoc* 2022; **60**: 817-820 [PMID: 36705133 DOI: 10.31729/jnma.7650]

6 **Shinde RK**, Rajendran R Jr. Spontaneous Intestinal Perforation in Neonates Involving the Cecum: A Case Report. *Cureus* 2023; **15**: e37322 [PMID: 37182043 DOI: 10.7759/cureus.37322]

7 **Hoshino N**, Endo H, Hida K, Kumamaru H, Hasegawa H, Ishigame T, Kitagawa Y, Kakeji Y, Miyata H, Sakai Y. Laparoscopic Surgery for Acute Diffuse Peritonitis Due to Gastrointestinal Perforation: A Nationwide Epidemiologic Study Using the National Clinical Database. *Ann*

Gastroenterol Surg 2022; **6**: 430-444 [PMID: 35634193 DOI: 10.1002/ags3.12533]

8 **Lee MO**, Jin SY, Lee SK, Hwang S, Kim TG, Song YG. Video-assisted thoracoscopic surgical wedge resection using multiplanar computed tomography reconstruction-fluoroscopy after CT guided microcoil localization. *Thorac Cancer* 2021; **12**: 1721-1725 [PMID: 33943015 DOI: 10.1111/1759-7714.13968]

9 **Withers BT**. Foreign bodies of the larynx; with report of an unusual case. *Ann Otol Rhinol Laryngol* 1949; **58**: 1085-1092 [PMID: 15410017 DOI: 10.1177/000348944905800410]

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