

World Journal of *Clinical Cases*

World J Clin Cases 2021 October 26; 9(30): 8953-9319



Contents

Thrice Monthly Volume 9 Number 30 October 26, 2021

REVIEW

- 8953 Endothelial progenitor cells and coronary artery disease: Current concepts and future research directions
Xiao ST, Kuang CY

MINIREVIEWS

- 8967 Regulation of bone metabolism mediated by β -adrenergic receptor and its clinical application
Zhong XP, Xia WF
- 8974 Tricuspid valve endocarditis: Cardiovascular imaging evaluation and management
Fava AM, Xu B

ORIGINAL ARTICLE

Case Control Study

- 8985 Novel application of multispectral refraction topography in the observation of myopic control effect by orthokeratology lens in adolescents
Ni NJ, Ma FY, Wu XM, Liu X, Zhang HY, Yu YF, Guo MC, Zhu SY

Retrospective Cohort Study

- 8999 Uncertainty in illness and coping styles: Moderating and mediating effects of resilience in stroke patients
Han ZT, Zhang HM, Wang YM, Zhu SS, Wang DY

Retrospective Study

- 9011 Development and validation of a prognostic nomogram model for Chinese patients with primary small cell carcinoma of the esophagus
Zhang DY, Huang GR, Ku JW, Zhao XK, Song X, Xu RH, Han WL, Zhou FY, Wang R, Wei MX, Wang LD
- 9023 Preliminary establishment of a spinal stability scoring system for multiple myeloma
Yao XC, Shi XJ, Xu ZY, Tan J, Wei YZ, Qi L, Zhou ZH, Du XR
- 9038 Effect of intrauterine perfusion of granular leukocyte-colony stimulating factor on the outcome of frozen embryo transfer
Zhu YC, Sun YX, Shen XY, Jiang Y, Liu JY
- 9050 "An integrated system, three separated responsibilities", a new fever clinic management model, in prevention and control of novel coronavirus pneumonia
Shen J, He Q, Shen T, Wu ZQ, Tan MM, Chen YL, Weng Q, Nie LM, Zhang HF, Zheng B, Zhang J

Clinical Trials Study

- 9059** Single dose dexamethasone prophylaxis of postembolisation syndrome after chemoembolisation in hepatocellular carcinoma patient: A randomised, double-blind, placebo-controlled study
Sainamthip P, Kongphanich C, Prasongsook N, Chirapongsathorn S

Observational Study

- 9070** Serum calcium, albumin, globulin and matrix metalloproteinase-9 levels in acute cerebral infarction patients
Zhong TT, Wang G, Wang XQ, Kong WD, Li XY, Xue Q, Zou YA

SYSTEMATIC REVIEWS

- 9077** Neoadjuvant radiotherapy dose escalation for locally advanced rectal cancers in the new era of radiotherapy: A review of literature
Delishaj D, Fumagalli IC, Ursino S, Cristaudo A, Colangelo F, Stefanelli A, Alghisi A, De Nobili G, D'Amico R, Cocchi A, Ardizzoia A, Soatti CP

META-ANALYSIS

- 9090** Clinical significance of breast cancer susceptibility gene 1 expression in resected non-small cell lung cancer: A meta-analysis
Gao Y, Luo XD, Yang XL, Tu D

CASE REPORT

- 9101** Particular tumor of the pancreas: A case report
Zhu MH, Nie CF
- 9108** Dynamic changes in the radiologic manifestation of a recurrent checkpoint inhibitor related pneumonitis in a non-small cell lung cancer patient: A case report
Tan PX, Huang W, Liu PP, Pan Y, Cui YH
- 9114** Spontaneous rupture of a mucinous cystic neoplasm of the liver resulting in a huge biloma in a pregnant woman: A case report
Kośnik A, Stadnik A, Szczepankiewicz B, Patkowski W, Wójcicki M
- 9122** Diagnosis and laparoscopic excision of accessory cavitated uterine mass in a young woman: A case report
Hu YL, Wang A, Chen J
- 9129** Unusual cervical foreign body - a neglected thermometer for 5 years: A case report
Yang L, Li W
- 9134** Long-term survival of a patient with pancreatic cancer and lung metastasis: A case report and review of literature
Yang WW, Yang L, Lu HZ, Sun YK
- 9144** Synchronous diagnosis and treatment of acute myeloid leukemia and chronic lymphocytic leukemia: Two case reports
Chen RR, Zhu LX, Wang LL, Li XY, Sun JN, Xie MX, Zhu JJ, Zhou D, Li JH, Huang X, Xie WZ, Ye XJ

- 9151** Conversion therapy of hepatic artery ligation combined with transcatheter arterial chemoembolization for treating liver cancer: A case report
Feng GY, Cheng Y, Xiong X, Shi ZR
- 9159** Hemophagocytic lymphohistiocytosis secondary to composite lymphoma: Two case reports
Shen J, Wang JS, Xie JL, Nong L, Chen JN, Wang Z
- 9168** Fatal visceral disseminated varicella-zoster virus infection in a renal transplant recipient: A case report
Wang D, Wang JQ, Tao XG
- 9174** Choriocarcinoma misdiagnosed as cerebral hemangioma: A case report
Huang HQ, Gong FM, Yin RT, Lin XJ
- 9182** Rapid progression of colonic mucinous adenocarcinoma with immunosuppressive condition: A case report and review of literature
Koseki Y, Kamimura K, Tanaka Y, Ohkoshi-Yamada M, Zhou Q, Matsumoto Y, Mizusawa T, Sato H, Sakamaki A, Umezu H, Yokoyama J, Terai S
- 9192** Temporary pacemaker protected transjugular intrahepatic portosystemic shunt in a patient with acute variceal bleeding and bradyarrhythmia: A case report
Yao X, Li SH, Fu LR, Tang SH, Qin JP
- 9198** Recurrent pyogenic liver abscess after pancreatoduodenectomy caused by common hepatic artery injury: A case report
Xie F, Wang J, Yang Q
- 9205** Transient ventricular arrhythmia as a rare cause of dizziness during exercise: A case report
Gao LL, Wu CH
- 9211** Successful management of infected right iliac pseudoaneurysm caused by penetration of migrated inferior vena cava filter: A case report
Weng CX, Wang SM, Wang TH, Zhao JC, Yuan D
- 9218** Anterior abdominal abscess - a rare manifestation of severe acute pancreatitis: A case report
Jia YC, Ding YX, Mei WT, Xue ZG, Zheng Z, Qu YX, Li J, Cao F, Li F
- 9228** Monteggia type-I equivalent fracture in a fourteen-month-old child: A case report
Li ML, Zhou WZ, Li LY, Li QW
- 9236** Diagnosis and treatment of primary pulmonary enteric adenocarcinoma: Report of Six cases
Tu LF, Sheng LY, Zhou JY, Wang XF, Wang YH, Shen Q, Shen YH
- 9244** Choroidal metastatic mucinous abscess caused by *Pseudomonas aeruginosa*: A case report
Li Z, Gao W, Tian YM, Xiao Y
- 9255** Diagnosis and treatment of acute graft-versus-host disease after liver transplantation: Report of six cases
Tian M, Lyu Y, Wang B, Liu C, Yu L, Shi JH, Liu XM, Zhang XG, Guo K, Li Y, Hu LS

- 9269** Hepatic portal venous gas without definite clinical manifestations of necrotizing enterocolitis in a 3-day-old full-term neonate: A case report
Yuan K, Chen QQ, Zhu YL, Luo F
- 9276** Emergence of lesions outside of the basal ganglia and irreversible damage to the basal ganglia with severe β -ketothiolase deficiency: A case report
Guo J, Ren D, Guo ZJ, Yu J, Liu F, Zhao RX, Wang Y
- 9285** Skeletal muscle metastasis with bone metaplasia from colon cancer: A case report and review of the literature
Guo Y, Wang S, Zhao ZY, Li JN, Shang A, Li DL, Wang M
- 9295** Biopsy-confirmed fenofibrate-induced severe jaundice: A case report
Lee HY, Lee AR, Yoo JJ, Chin S, Kim SG, Kim YS
- 9302** Missense mutation in *DYNC1H1* gene caused psychomotor developmental delay and muscle weakness: A case report
Ding FJ, Lyu GZ, Zhang VW, Jin H
- 9310** Isolated hepatic tuberculosis associated with portal vein thrombosis and hepatitis B virus coinfection: A case report and review of the literature
Zheng SM, Lin N, Tang SH, Yang JY, Wang HQ, Luo SL, Zhang Y, Mu D

ABOUT COVER

Editorial Board Member of *World Journal of Clinical Cases*, Rahul Gupta, MBBS, MCh, MD, Assistant Professor, Chief Doctor, Consultant Physician-Scientist, Surgeon, Department of Gastrointestinal Surgery, Synergy Institute of Medical Sciences, Dehradun 248001, Uttarakhand, India. rahul.g.85@gmail.com

AIMS AND SCOPE

The primary aim of *World Journal of Clinical Cases* (WJCC, *World J Clin Cases*) is to provide scholars and readers from various fields of clinical medicine with a platform to publish high-quality clinical research articles and communicate their research findings online.

WJCC mainly publishes articles reporting research results and findings obtained in the field of clinical medicine and covering a wide range of topics, including case control studies, retrospective cohort studies, retrospective studies, clinical trials studies, observational studies, prospective studies, randomized controlled trials, randomized clinical trials, systematic reviews, meta-analysis, and case reports.

INDEXING/ABSTRACTING

The WJCC is now indexed in Science Citation Index Expanded (also known as SciSearch®), Journal Citation Reports/Science Edition, Scopus, PubMed, and PubMed Central. The 2021 Edition of Journal Citation Reports® cites the 2020 impact factor (IF) for WJCC as 1.337; IF without journal self cites: 1.301; 5-year IF: 1.742; Journal Citation Indicator: 0.33; Ranking: 119 among 169 journals in medicine, general and internal; and Quartile category: Q3. The WJCC's CiteScore for 2020 is 0.8 and Scopus CiteScore rank 2020: General Medicine is 493/793.

RESPONSIBLE EDITORS FOR THIS ISSUE

Production Editor: Ji-Hong Lin; Production Department Director: Yun-Jie Ma; Editorial Office Director: Jin-Lei Wang.

NAME OF JOURNAL

World Journal of Clinical Cases

ISSN

ISSN 2307-8960 (online)

LAUNCH DATE

April 16, 2013

FREQUENCY

Thrice Monthly

EDITORS-IN-CHIEF

Dennis A Bloomfield, Sandro Vento, Bao-Gan Peng

EDITORIAL BOARD MEMBERS

<https://www.wjgnet.com/2307-8960/editorialboard.htm>

PUBLICATION DATE

October 26, 2021

COPYRIGHT

© 2021 Baishideng Publishing Group Inc

INSTRUCTIONS TO AUTHORS

<https://www.wjgnet.com/bpg/gerinfo/204>

GUIDELINES FOR ETHICS DOCUMENTS

<https://www.wjgnet.com/bpg/GerInfo/287>

GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH

<https://www.wjgnet.com/bpg/gerinfo/240>

PUBLICATION ETHICS

<https://www.wjgnet.com/bpg/GerInfo/288>

PUBLICATION MISCONDUCT

<https://www.wjgnet.com/bpg/gerinfo/208>

ARTICLE PROCESSING CHARGE

<https://www.wjgnet.com/bpg/gerinfo/242>

STEPS FOR SUBMITTING MANUSCRIPTS

<https://www.wjgnet.com/bpg/GerInfo/239>

ONLINE SUBMISSION

<https://www.f6publishing.com>



Fatal visceral disseminated varicella-zoster virus infection in a renal transplant recipient: A case report

Di Wang, Jin-Quan Wang, Xiao-Gen Tao

ORCID number: Di Wang 0000-0002-8279-0346; Jin-Quan Wang 0000-0002-5100-9748; Xiao-Gen Tao 0000-0002-0959-8876.

Author contributions: Wang D treated the patient, collected data, wrote the paper, and approved the final manuscript; Tao XG treated the patient, revised the paper, and approved the final manuscript; Wang JQ performed the systematic literature review, reviewed the paper, and approved the final manuscript.

Informed consent statement:

Written informed consent was obtained from the patient's father for the publication of this case report.

Conflict-of-interest statement:

The authors have no conflicts of interest to declare.

CARE Checklist (2016) statement:

The authors have read the CARE Checklist (2016), and the manuscript was prepared and revised according to the CARE Checklist (2016).

Open-Access: This article is an open-access article that was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution

Di Wang, Jin-Quan Wang, Xiao-Gen Tao, Department of Intensive Care Medicine, The First Affiliated Hospital of USTC, Division of Life Sciences and Medicine, University of Science and Technology of China, Hefei 230036, Anhui Province, China

Corresponding author: Xiao-Gen Tao, DPhil, Chief Doctor, Department of Intensive Care Medicine, The First Affiliated Hospital of USTC, Division of Life Sciences and Medicine, University of Science and Technology of China, No. 17 Lujiang Road, Hefei 230036, Anhui Province, China. txg0724@163.com

Abstract

BACKGROUND

Visceral disseminated varicella-zoster virus (VZV) infection is a rare but life-threatening disease. In transplant recipients with VZV infection, visceral dissemination may develop without skin eruptions, which leads to the failure of early diagnosis.

CASE SUMMARY

The patient was a 33-year-old male renal recipient who was referred to our hospital with severe upper abdominal pain of 3-d duration. On admission, the patient rapidly developed septic shock and multiple organ dysfunction syndrome with liver dysfunction and acute kidney injury. Next-generation sequencing of peripheral blood yielded 39224 sequence reads of VZV, and real-time polymerase chain reaction for VZV was positive, with 1.2×10^7 copies/mL. The final diagnosis was visceral disseminated VZV infection. Acyclovir and supportive therapy were started, but the patient died of severe visceral organ damage 16 h after admission.

CONCLUSION

Visceral disseminated VZV infection is possible in renal transplant recipients presenting abdominal pain and rapidly-evolving organ damage without skin involvement.

Key Words: Septic shock; Visceral disseminated infection; Renal transplantation; Next-generation sequencing; Multiple organ failure; Case report

©The Author(s) 2021. Published by Baishideng Publishing Group Inc. All rights reserved.

NonCommercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>

Manuscript source: Unsolicited manuscript

Specialty type: Medicine, research and experimental

Country/Territory of origin: China

Peer-review report's scientific quality classification

Grade A (Excellent): 0
Grade B (Very good): B
Grade C (Good): 0
Grade D (Fair): 0
Grade E (Poor): 0

Received: April 20, 2021

Peer-review started: April 20, 2021

First decision: July 15, 2021

Revised: July 16, 2021

Accepted: September 14, 2021

Article in press: September 14, 2021

Published online: October 26, 2021

P-Reviewer: Salvadori M

S-Editor: Gao CC

L-Editor: A

P-Editor: Yuan YY



Core Tip: In transplant recipients, visceral disseminated varicella-zoster virus (VZV) infection may develop without skin eruptions, which leads to the failure of early diagnosis and fatal outcome. Early diagnosis and prompt antiviral therapy is the key to successful treatment. Next-generation sequencing is a promising tool for early detection of VZV infection in kidney transplant patients, even if VZV infection is not suspected.

Citation: Wang D, Wang JQ, Tao XG. Fatal visceral disseminated varicella-zoster virus infection in a renal transplant recipient: A case report. *World J Clin Cases* 2021; 9(30): 9168-9173

URL: <https://www.wjgnet.com/2307-8960/full/v9/i30/9168.htm>

DOI: <https://dx.doi.org/10.12998/wjcc.v9.i30.9168>

INTRODUCTION

Varicella-zoster virus (VZV), also known as human alphaherpesvirus 3, causes acute varicella (chickenpox) as a primary infection, in which VZV travels to sensory nerve ganglia where it becomes dormant as a potentially pathogenic virus[1]. Years later, VZV can reactivate and cause herpes zoster (shingles) when cell-mediated immunity to VZV wanes with aging or becomes disrupted in a compromised immune state. In solid organ transplant recipients, reactivation of VZV is likely to involve dissemination to multiple visceral organs, which induces hepatitis, pneumonia, encephalitis, and even pancreatitis. Viscerally disseminated VZV infection is life-threatening and early diagnosis is challenging because visceral complications often precede skin eruptions [2]. This case of viscerally disseminated VZV infection in a kidney recipient emphasizes the importance of early diagnosis and prompt treatment.

CASE PRESENTATION

Chief complaints

A 33-year-old renal transplant recipient was referred to our hospital with severe upper abdominal pain of 3-d duration.

History of present illness

Six months previously, the patient underwent parent-to-child kidney transplantation for end-stage renal disease and was then started on immunosuppressive therapy with methylprednisolone, tacrolimus, and mycophenolate mofetil (MMF). Three days before hospital admission, he developed severe acute upper abdominal pain radiating towards his back and was admitted to a local hospital. As abdominal computed tomography (CT) and ultrasonography results were normal, only analgesic treatment was given. However, the patient's aspartate aminotransferase (AST) and alanine aminotransferase (ALT) increased significantly, and he was referred to our hospital. On admission to the organ transplant center at our hospital, he complained of nausea and upper abdominal pain. Following a diagnosis of acute abdominal pain and liver damage, the patient was prescribed flurbiprofen tapes for pain relief, intravenous magnesium isoglycyrrhizinate against liver damage, and empirical antimicrobial therapy with intravenous cefoperazone sodium and sulbactam sodium. The patient rapidly developed septic shock and multiple organ dysfunction syndrome (commonly known as MODS) with liver dysfunction and acute kidney injury. Two days later, the patient was transferred to our intensive care unit (ICU).

History of past illness

He had a 3-year history of end-stage renal failure.

Personal and family history

He had no other specific diseases or familial medical history.

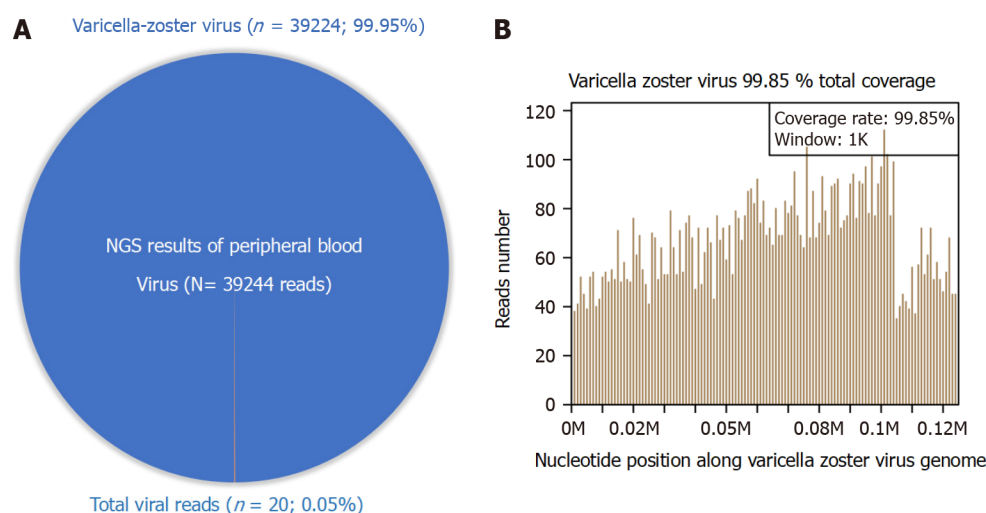


Figure 1 Next-generation sequencing of peripheral blood showed 39,224 reads mapped on the varicella-zoster virus genome sequence. A: Accounting for 99.95% of the total viral reads; B: Covering 99.8% of the varicella-zoster virus genome.

Physical examination

On admission, the patient was lethargic, with a heart rate of 136 beats/min, respiratory rate of 23 breaths/min, blood pressure of 83/42 mmHg, and body temperature of 36.8 °C. Abdominal examination revealed tenderness in the upper quadrants but no muscle guarding or rebound tenderness.

Laboratory examinations

Laboratory test results revealed high levels of ALT (4814 U/L), AST (8574 U/L), alkaline phosphatase (251 U/L), and gamma-glutamyltransferase (165 U/L), high concentrations of C-reactive protein (53.1 mg/L), procalcitonin (0.33 ng/mL), and creatinine (203 μmol/L), prolonged activated partial thromboplastin time and thrombin time (to about twice normal), and low fibrinogen (0.92 g/L). Serological tests for hepatitis A, B, and C viruses, human immunodeficiency virus, and treponema pallidum were all negative, except for hepatitis B surface and core antibodies. Immunoglobulin (Ig) M antibodies against toxoplasma, rubella virus, cytomegalovirus, and herpes simplex virus 2 were all absent. Blood culture and polymerase chain reaction (PCR) of Epstein-Barr virus DNA were negative.

Imaging examinations

Abdominal ultrasonography revealed a normal pancreas, spleen, and gallbladder. The common bile duct was without stones and had a normal diameter. Ascites or abnormal fluid collection were not seen, and there were no focal liver lesions. Abdominal and pelvic CT revealed no notable abnormalities or evidence of intestinal obstruction, perforation, or mesenteric artery thrombosis. Chest X-ray and electrocardiogram were both normal.

Further diagnostic workup

Separate samples of peripheral blood were collected for next-generation sequencing (NGS), real-time PCR, and IgG assays. The patient was VZV IgG-negative. NGS found 39224 reads mapped on the VZV genome sequence that covered 99.8% of the total VZV genome and accounted for 99.95% of the total viral reads (Figure 1). Real-time PCR for VZV was positive, with 1.2×10^7 copies/mL.

FINAL DIAGNOSIS

The patient's primary complaint, symptoms, and physical examination, NGS, and real-time PCR results supported a final diagnosis of visceral disseminated VZV infection, septic shock, and MODS with liver dysfunction and acute kidney injury.

TREATMENT

On admission, we considered the possibility of visceral disseminated VZV infection because of acute upper abdominal pain and rapidly evolving MODS after renal transplantation. We promptly initiated antiviral therapy with intravenous acyclovir (750 mg q8 h) combined with intravenous meropenem, linezolid, and caspofungin as empirical antibiotic treatment. Noradrenaline and terlipressin were given to maintain blood pressure, and intravenous sodium bicarbonate was given to correct metabolic acidosis. After the diagnosis of visceral disseminated VZV infection was confirmed, acyclovir treatment and supportive treatment were continued.

OUTCOME AND FOLLOW-UP

Unfortunately, the patient's condition deteriorated quickly, with acute liver failure, disseminated intravascular coagulation, acute respiratory failure, and acute renal injury. He died 16 h after ICU admission. An autopsy was not performed.

DISCUSSION

VZV is the second most common viral pathogen after cytomegalovirus in renal transplant recipients during the first year after transplantation[3]. Intensive immunosuppression regimens make renal transplant recipients more susceptible to viral infection. MMF, a frequently used immunosuppressive drug, is associated with an increased risk of VZV infection in kidney transplant recipients[4]. Primary VZV infection presents as varicella; shingles is caused by reactivation of latent VZV infection. Either primary infection or reactivation from latency can progress to visceral dissemination in kidney recipients, which causes severe complications[2]. A review of studies reporting a total of 56 kidney transplant recipients with disseminated VZV infection found that 33 (59%) had visceral dissemination that caused hepatitis in 31%, pneumonitis in 29%, neurological complications in 12%, and pancreatitis in 4% of those patients[5]. In this case, methylprednisolone use for 6 mo after renal transplantation may have increased the risk of VZV infection.

Several cases of visceral disseminated VZV infection in renal transplant recipients have been reported. A recent case occurred in a 66-year-old patient in Australia who initially presented with chest and abdominal pain and then simultaneously developed hepatitis and pancreatitis. He was diagnosed with visceral disseminated VZV and received intravenous acyclovir (10 mg/kg twice daily) only after developing a widespread vesicular rash 11 d following the onset of chest and back pain. Despite supportive care and antiviral therapy, the patient died after 6 d in the ICU[6]. Another case involved a renal transplant recipient in India who presented after 7 d of severe epigastric pain and 4 d of multiple vesiculopapular rashes over the entire body. The typical varicella rash plus increased serum lipase and liver enzyme levels led to a diagnosis of visceral disseminated VZV infection complicated by hepatitis and pancreatitis. Intravenous acyclovir was started on hospital admission. After 48 h, the patient's pain was relieved and the liver enzymes returned to normal levels[7]. A report published in 2002 included 4 renal transplant recipients with visceral disseminated VZV infection[8]. One patient presented with acute epigastric pain, nausea, vomiting, and generalized pustulosis on admission. He was diagnosed by identification of VZV DNA in the pustule content, and the case was complicated with hepatitis, pneumonitis, and pancreatitis. He recovered fully after acyclovir therapy for 13 d. Patient two presented with acute epigastric pain, elevated liver enzymes and pancreatic amylase, and activated coagulation. One day after admission, he developed a vesicular rash of the skin and buccal mucosa. Visceral disseminated VZV infection was diagnosed after detecting VZV DNA in the vesicular fluid. He recovered after 8 d of acyclovir therapy. Patient three was admitted with progressive dyspnea, and a bilateral vesicular rash and rackless partially covering the chest. The chest radiograph showed bilateral interstitial infiltration. Bronchoalveolar lavage fluid was positive for cytomegalovirus early antigen and VZV antigen. The diagnosis was VZV and cytomegalovirus pneumonitis. The patient recovered after 26 d of ganciclovir. Patient four was admitted with disseminated multifocal itching vesicles over the entire body, and diffuse pain, swelling, and redness on the right side of the face. Skin swabs of the excoriations around the nose were positive for *Staphylococcus aureus* and the vesicles were positive for VZV DNA by PCR. The diagnosis was phlegmonous bacterial infection of the face

and visceral disseminated VZV infection complicated by hepatitis. The patient was only given antibiotics and recovered after 10 d.

The clinical characteristics of six previously reported cases and our case of renal transplant recipients with visceral disseminated VZV infection included initial symptoms of intense abdominal pain and widespread vesicular rash, with rapidly evolving visceral organ damage including hepatitis, pneumonitis, and pancreatitis. Early diagnosis and prompt acyclovir treatment were key for improving the prognosis of those patients. In contrast to survivors, patients who did not survive presented initially with abdominal pain in the absence of typical skin rashes, which led to the failure of a prompt diagnosis of VZV infection and the lack of prompt antiviral treatment. The importance of early diagnosis and prompt treatment is highlighted by a review of the outcomes of 38 patients with hematological or rheumatic disorders complicated by visceral VZV infections. In those patients, the mean interval between the onset of symptoms and initiation of antiviral therapy was 5.3 d in survivors and 8.5 d in nonsurvivors[9]. The difference in survival was not tested for significance but did indicate that the failure of prompt diagnosis and early antiviral therapy in patients with disseminated VZV infection and delayed or absent skin lesions resulted in a poor prognosis.

Early diagnosis is the key to prompt treatment and a good prognosis of visceral disseminated VZV infection, especially for cases with delayed or absent skin lesions. Real-time PCR and direct immunofluorescence can detect VZV DNA and VZV antigens in serum and tissues. Serological testing can identify anti-VZV IgM/IgG. PCR is a rapid, highly specific, and sensitive laboratory test for detecting VZV DNA in serum, vesicle fluid, spinal fluid, skin vesicles, and other tissues. Direct immunofluorescence can detect VZV antigens in vesicles, and despite being less sensitive than PCR, it is an alternative to diagnose VZV infection. Serologic testing of serum is accurate, but false negative results may result in immunocompromised patients because of the time it takes to develop antibodies[1]. When VZV infection is suspected, doctors will order PCR and direct fluorescent assays specific for VZV. However, for disseminated VZV infection that begins without skin manifestations, doctors generally ignore the possibility of VZV infection, making early diagnosis difficult. NGS has recently emerged as a commercially available method for diagnosing infectious diseases. NGS is independent of specific primers to pre-amplify target sequences and provides an all-in-one diagnostic test. Massive parallel sequencing that occurs during NGS can rapidly and sensitively sequence millions of small DNA fragments present in a very heterogeneous mixture. These advantages make NGS an ideal tool to detect uncommon viruses[10,11]. In our case, we suspected VZV infection and performed NGS on admission to the ICU, and the result confirmed a diagnosis of visceral disseminated VZV infection within 24 h. It can be inferred that if NGS were conducted at the onset of acute abdominal pain, an early diagnosis of disseminated VZV infection would have been achieved, even if it was not suspected.

CONCLUSION

The case described herein indicates that visceral disseminated VZV infection should be considered if a renal transplant recipient initially presents with acute abdominal pain and rapidly develops visceral organ damage, even without skin rashes. Prompt acyclovir treatment is the key to achieving a good prognosis. NGS facilitates early, accurate diagnosis.

REFERENCES

- 1 Gershon AA, Breuer J, Cohen JI, Cohrs RJ, Gershon MD, Gilden D, Grose C, Hambleton S, Kennedy PG, Oxman MN, Seward JF, Yamanishi K. Varicella zoster virus infection. *Nat Rev Dis Primers* 2015; 1: 15016 [PMID: 27188665 DOI: 10.1038/nrdp.2015.16]
- 2 Pergam SA, Limaye AP; AST Infectious Diseases Community of Practice. Varicella zoster virus in solid organ transplantation. *Am J Transplant* 2013; 13 Suppl 4: 138-146 [PMID: 23465007 DOI: 10.1111/ajt.12107]
- 3 Eidgahi ES, Lotfi Z, Tayefi M, Bahrami A, Shams SF, Shakeri S, Sheikhi M. Incidence and risk factors of common viral infections among renal transplant recipients during the first year post-transplant in North-eastern Iran. *Saudi J Kidney Dis Transpl* 2019; 30: 597-605 [PMID: 31249223 DOI: 10.4103/1319-2442.261332]
- 4 Lauzurica R, Bayés B, Frías C, Fontseré N, Hernandez A, Matas L, Jimenez A, Bonet J, Romero R.

- Disseminated varicella infection in adult renal allograft recipients: role of mycophenolate mofetil. *Transplant Proc* 2003; **35**: 1758-1759 [PMID: [12962784](#) DOI: [10.1016/s0041-1345\(03\)00684-5](#)]
- 5 **Rommelaere M**, Maréchal C, Yombi JC, Goffin E, Kanaan N. Disseminated varicella zoster virus infection in adult renal transplant recipients: outcome and risk factors. *Transplant Proc* 2012; **44**: 2814-2817 [PMID: [23146530](#) DOI: [10.1016/j.transproceed.2012.09.090](#)]
 - 6 **Loftus MJ**, Yong MK, Wilson S, Peleg AY. Fatal disseminated visceral varicella zoster virus infection in a renal transplant recipient. *Transpl Infect Dis* 2019; **21**: e13062 [PMID: [30756453](#) DOI: [10.1111/tid.13062](#)]
 - 7 **Chhabra P**, Ranjan P, Bhasin DK. Simultaneous Occurrence of Varicella Zoster Virus-Induced Pancreatitis and Hepatitis in a Renal Transplant Recipient: A Case Report and Review of Literature. *Perm J* 2017; **21**: 16-083 [PMID: [28333601](#) DOI: [10.7812/TPP/16-083](#)]
 - 8 **Fehr T**, Bossart W, Wahl C, Binswanger U. Disseminated varicella infection in adult renal allograft recipients: four cases and a review of the literature. *Transplantation* 2002; **73**: 608-611 [PMID: [11889440](#) DOI: [10.1097/00007890-200202270-00023](#)]
 - 9 **Tsuji H**, Yoshifuji H, Fujii T, Matsuo T, Nakashima R, Imura Y, Yukawa N, Ohmura K, Sumiyoshi S, Mimori T. Visceral disseminated varicella zoster virus infection after rituximab treatment for granulomatosis with polyangiitis. *Mod Rheumatol* 2017; **27**: 155-161 [PMID: [25159158](#) DOI: [10.3109/14397595.2014.948981](#)]
 - 10 **Datta S**, Budhaliya R, Das B, Chatterjee S, Vanlalhmuka, Veer V. Next-generation sequencing in clinical virology: Discovery of new viruses. *World J Virol* 2015; **4**: 265-276 [PMID: [26279987](#) DOI: [10.5501/wjv.v4.i3.265](#)]
 - 11 **Kustin T**, Ling G, Sharabi S, Ram D, Friedman N, Zuckerman N, Bucris ED, Glatman-Freedman A, Stern A, Mandelboim M. A method to identify respiratory virus infections in clinical samples using next-generation sequencing. *Sci Rep* 2019; **9**: 2606 [PMID: [30796243](#) DOI: [10.1038/s41598-018-37483-w](#)]



Published by **Baishideng Publishing Group Inc**
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA

Telephone: +1-925-3991568

E-mail: bpgoffice@wjgnet.com

Help Desk: <https://www.f6publishing.com/helpdesk>

<https://www.wjgnet.com>

