

World Journal of *Clinical Cases*

World J Clin Cases 2022 April 26; 10(12): 3639-3968



EVIDENCE REVIEW

- 3639** Tilt and decentration with various intraocular lenses: A narrative review
Chen XY, Wang YC, Zhao TY, Wang ZZ, Wang W

REVIEW

- 3647** Role of zonula occludens in gastrointestinal and liver cancers
Ram AK, Vairappan B

MINIREVIEWS

- 3662** Pathophysiological mechanisms of hepatic stellate cells activation in liver fibrosis
Garbuzenko DV

ORIGINAL ARTICLE

Retrospective Cohort Study

- 3677** Predictors of unfavorable outcome at 90 days in basilar artery occlusion patients
Chiu YC, Yang JL, Wang WC, Huang HY, Chen WL, Yen PS, Tseng YL, Chen HH, Tsai ST

Retrospective Study

- 3686** Role of multidetector computed tomography in patients with acute infectious colitis
Yu SJ, Heo JH, Choi EJ, Kim JH, Lee HS, Kim SY, Lim JH
- 3698** Efficacy and prognostic factors of neoadjuvant chemotherapy for triple-negative breast cancer
Ding F, Chen RY, Hou J, Guo J, Dong TY
- 3709** Relationship between subgroups of central and lateral lymph node metastasis in clinically node-negative papillary thyroid carcinoma
Zhou J, Li DX, Gao H, Su XL
- 3720** Nomogram to predict postoperative complications in elderly with total hip replacement
Tan XJ, Gu XX, Ge FM, Li ZY, Zhang LQ
- 3729** Flap failure prediction in microvascular tissue reconstruction using machine learning algorithms
Shi YC, Li J, Li SJ, Li ZP, Zhang HJ, Wu ZY, Wu ZY

Observational Study

- 3739** Surgery in platinum-resistant recurrent epithelial ovarian carcinoma
Zhao LQ, Gao W, Zhang P, Zhang YL, Fang CY, Shou HF

- 3754** Anorectal dysfunction in patients with mid-low rectal cancer after surgery: A pilot study with three-dimensional high-resolution manometry

Pi YN, Xiao Y, Wang ZF, Lin GL, Qiu HZ, Fang XC

Randomized Controlled Trial

- 3764** Effect of wrist-ankle acupuncture on propofol dosage during painless colonoscopy: A randomized controlled prospective study

He T, Liu C, Lu ZX, Kong LL, Li Y, Xu Z, Dong YJ, Hao W

META-ANALYSIS

- 3773** Melatonin intervention to prevent delirium in hospitalized patients: A meta-analysis

You W, Fan XY, Lei C, Nie CC, Chen Y, Wang XL

- 3787** Risk factors for hospital readmissions in pneumonia patients: A systematic review and meta-analysis

Fang YY, Ni JC, Wang Y, Yu JH, Fu LL

CASE REPORT

- 3801** Anti-programmed death 1 antibody in the treatment of coexistent *Mycobacterium fortuitum* and lung cancer: A case report

Zhang CC, Chen P

- 3808** Acute pancreatitis-induced thrombotic thrombocytopenic purpura: A case report

Wang CH, Jin HF, Liu WG, Guo Y, Liu Z

- 3814** Successful management of life-threatening aortoesophageal fistula: A case report and review of the literature

Zhong XQ, Li GX

- 3822** Isolated coagulopathy without classic CRAB symptoms as the initial manifestation of multiple myeloma: A case report

Zhang Y, Xu F, Wen JJ, Shi L, Zhou QL

- 3828** Evaluation of intracoronary function after reduction of ventricular rate by esmolol in severe stenotic myocardial bridge: A case report

Sun LJ, Yan DG, Huang SW

- 3834** Pediatric living donor liver transplantation using liver allograft after *ex vivo* backtable resection of hemangioma: A case report

Li SX, Tang HN, Lv GY, Chen X

- 3842** Kimura's disease in soft palate with clinical and histopathological presentation: A case report

Li W

- 3849** Combined targeted therapy and immunotherapy in anaplastic thyroid carcinoma with distant metastasis: A case report

Ma DX, Ding XP, Zhang C, Shi P

- 3856** Successful multimodality treatment of metastatic gallbladder cancer: A case report and review of literature
Zhang B, Li S, Liu ZY, Peiris KGK, Song LF, Liu MC, Luo P, Shang D, Bi W
- 3866** Ischemic colitis after receiving the second dose of a COVID-19 inactivated vaccine: A case report
Cui MH, Hou XL, Liu JY
- 3872** Cryoballoon pulmonary vein isolation and left atrial appendage occlusion prior to atrial septal defect closure: A case report
Wu YC, Wang MX, Chen GC, Ruan ZB, Zhang QQ
- 3879** Surgical treatment for a combined anterior cruciate ligament and posterior cruciate ligament avulsion fracture: A case report
Yoshida K, Hakozaiki M, Kobayashi H, Kimura M, Konno S
- 3886** Successful robot-assisted partial nephrectomy for giant renal hilum angiomyolipoma through the retroperitoneal approach: A case report
Luo SH, Zeng QS, Chen JX, Huang B, Wang ZR, Li WJ, Yang Y, Chen LW
- 3893** Cryptococcal antigen testing of lung tissue homogenate improves pulmonary cryptococcosis diagnosis: Two case reports
Wang WY, Zheng YL, Jiang LB
- 3899** Combined use of extracorporeal membrane oxygenation with interventional surgery for acute pancreatitis with pulmonary embolism: A case report
Yan LL, Jin XX, Yan XD, Peng JB, Li ZY, He BL
- 3907** Dynamic navigation system-guided trans-inferior alveolar nerve implant placement in the atrophic posterior mandible: A case report
Chen LW, Zhao XE, Yan Q, Xia HB, Sun Q
- 3916** Anti-glomerular basement membrane disease with IgA nephropathy: A case report
Guo C, Ye M, Li S, Zhu TT, Rao XR
- 3923** Amniotic membrane transplantation in a patient with impending perforated corneal ulcer caused by *Streptococcus mitis*: A case report and review of literature
Hsiao FC, Meir YJJ, Yeh LK, Tan HY, Hsiao CH, Ma DHK, Wu WC, Chen HC
- 3930** Steriod for Autoimmune pancreatitis complicating by gastric varices: A case report
Hao NB, Li X, Hu WW, Zhang D, Xie J, Wang XL, Li CZ
- 3936** Antithrombotic treatment strategy for patients with coronary artery ectasia and acute myocardial infarction: A case report
Liu RF, Gao XY, Liang SW, Zhao HQ
- 3944** Mesh plug erosion into the small intestine after inguinal hernia repair: A case report
Xie TH, Wang Q, Ha SN, Cheng SJ, Niu Z, Ren XX, Sun Q, Jin XS
- 3951** Recurrence of infectious mononucleosis in adults after remission for 3 years: A case report
Zhang XY, Teng QB

- 3959** Vertical direction impaction of kissing molars: A case report

Wen C, Jiang R, Zhang ZQ, Lei B, Yan YZ, Zhong YQ, Tang L

LETTER TO THE EDITOR

- 3966** Comment on “Outcomes of different minimally invasive surgical treatments for vertebral compression fractures: An observational study”

Ma L, Luo ZW, Sun YY

ABOUT COVER

Editorial Board Member of *World Journal of Clinical Cases*, Potluri Leela Ravishankar, MDS, Professor, Department of Periodontics, SRM Kattankulathur Dental College and Hospital, SRM University, Chennai 603203, Tamil Nadu, India. plrs6@yahoo.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: *Ying-Yi Yuan*, Production Department Director: *Xu Guo*, 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

Bao-Gan Peng, Jerzy Tadeusz Chudek, George Kontogeorgos, Maurizio Serati, Ja Hyeon Ku

EDITORIAL BOARD MEMBERS

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

PUBLICATION DATE

April 26, 2022

COPYRIGHT

© 2022 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>



Amniotic membrane transplantation in a patient with impending perforated corneal ulcer caused by *Streptococcus mitis*: A case report and review of literature

Fang-Chi Hsiao, Yaa-Jyuhn James Meir, Lung-Kun Yeh, Hsin-Yuan Tan, Ching-Hsi Hsiao, David Hui-Kang Ma, Wei-Chi Wu, Hung-Chi Chen

Specialty type: Ophthalmology

Provenance and peer review:

Unsolicited article; Externally peer reviewed.

Peer-review model: Single blind

Peer-review report's scientific quality classification

Grade A (Excellent): A

Grade B (Very good): B

Grade C (Good): 0

Grade D (Fair): D

Grade E (Poor): 0

P-Reviewer: Dai Q, China; Khan I, Pakistan; Salvadori M, Italy

Received: September 21, 2021

Peer-review started: September 21, 2021

First decision: December 27, 2021

Revised: February 3, 2022

Accepted: March 6, 2022

Article in press: March 6, 2022

Published online: April 26, 2022



Fang-Chi Hsiao, Lung-Kun Yeh, Hsin-Yuan Tan, Ching-Hsi Hsiao, David Hui-Kang Ma, Wei-Chi Wu, Hung-Chi Chen, Department of Ophthalmology, Chang Gung Memorial Hospital, Taoyuan 333423, Taiwan

Yaa-Jyuhn James Meir, Biomedical Sciences, College of Medicine, Chang Gung University, Taoyuan 33305, Taiwan

Lung-Kun Yeh, Hsin-Yuan Tan, Ching-Hsi Hsiao, David Hui-Kang Ma, Wei-Chi Wu, Hung-Chi Chen, Department of Medicine, College of Medicine, Chang Gung University, Taoyuan 33305, Taiwan

Hung-Chi Chen, Center for Tissue Engineering, Chang Gung Memorial Hospital, Taoyuan 333423, Taiwan

Corresponding author: Hung-Chi Chen, MD, PhD, Professor, Department of Ophthalmology, Chang Gung Memorial Hospital, No. 5, Fuxing Street, Guishan District, Taoyuan 333423, Taiwan. mr3756@cgmh.org.tw

Abstract

BACKGROUND

Streptococcus mitis (*S. mitis*) is an opportunistic pathogen that can lead to severe ocular infections. In previous reports, penetrating keratoplasty (PK) was usually adopted for the treatment of persistent corneal ulcers. This report describes an unusual case of nonhealing descemetocoele caused by *S. mitis* treated by antibiotics plus amniotic membrane transplantation (AMT).

CASE SUMMARY

A 63-year-old woman presented with a right persistent corneal ulcer that she had suffered from for the past 9 mo. The culture of a corneal scraping yielded *S. mitis*. The right eye descemetocoele decreased in diameter from 3 to 0.8 mm after the continuous administration of topical vancomycin and ceftriaxone for 2 wk. Due to the slow healing, AMT was performed. Her corneal erosion healed and gradually became clear. Her visual acuity recovered from initially counting fingers to 100/200 at the last follow-up, 67 mo after AMT.

CONCLUSION

Antibiotics plus AMT may be an effective alternative treatment other than PK to promote epithelialization and to reduce inflammation in the corneas complicated by *S. mitis* keratitis.

Key Words: Persistent corneal ulcer; Amniotic membrane transplantation; *Streptococcus mitis*; Case report

©The Author(s) 2022. Published by Baishideng Publishing Group Inc. All rights reserved.

Core Tip: In this case, we described the clinical and treatment course of an impending perforated corneal ulcer caused by *Streptococcus mitis* (*S. mitis*). We also demonstrated that treatment with antibiotics and amniotic membrane transplantation was successful, without the need for penetrating keratoplasty, and this could be considered an alternative treatment for nonhealing descemetocoeles induced by *S. mitis*, as compared to the previous treatment.

Citation: Hsiao FC, Meir YJJ, Yeh LK, Tan HY, Hsiao CH, Ma DHK, Wu WC, Chen HC. Amniotic membrane transplantation in a patient with impending perforated corneal ulcer caused by *Streptococcus mitis*: A case report and review of literature. *World J Clin Cases* 2022; 10(12): 3923-3929

URL: <https://www.wjgnet.com/2307-8960/full/v10/i12/3923.htm>

DOI: <https://dx.doi.org/10.12998/wjcc.v10.i12.3923>

INTRODUCTION

Streptococcus mitis (*S. mitis*) is an alpha-hemolytic, facultative anaerobic species of the viridans group streptococci. *S. mitis* is a commensal of the human oropharynx and is also found on the skin, in the gastrointestinal tract, and in the female genital tract. Although the low virulence and pathogenicity of this bacteria are recognized, *S. mitis* is considered an opportunistic pathogen that can lead to the development of severe infections, including endophthalmitis, infective endocarditis, bacteremia, upper respiratory tract infection, and meningitis[1,2]. Moreover, corneal ulcers caused by *S. mitis* are rare and have seldom been described. In previous reports, penetrating keratoplasty (PK) was usually adopted for the treatment of persistent corneal ulcers[3-5].

As an alternative treatment to reconstruct the ocular surface, amniotic membrane transplantation (AMT) has been proposed to promote epithelial healing and to reduce neovascularization, inflammation, and scarring, and this method has been demonstrated to be effective in promoting wound healing and in preventing corneal perforation in infectious keratitis[6-9]. In this case, we demonstrated that AMT may be successfully used to treat a patient with a nonhealing descemetocoele caused by *S. mitis* rather than performing PK.

CASE PRESENTATION

Chief complaints

A 63-year-old Taiwanese Han woman presented with right eye pain for 9 mo.

History of present illness

The patient had experienced right persistent corneal ulcers for 9 mo despite the use of biweekly therapeutic soft contact lenses along with unknown topical agents, which resulted in recurrent symptoms of ocular redness, pain, and blurred vision. Within a few years prior to the current event, she reported repeated episodes that occurred approximately two to three times yearly of right eye redness accompanied by photophobia that resolved spontaneously.

History of past illness

This patient had a history of herpes zoster ophthalmicus 18 years ago and an underlying disease of hypertension.

Personal and family history

The patient denied any known family history.

Physical examination

Upon the initial ocular examination, her right visual acuity (VA) was counting fingers. A 3 mm × 2 mm

central epithelial defect with stromal infiltration and a 1 mm × 1 mm inferonasal paracentral descemetocoele were noted at her right eye (Figure 1A). The VA change is listed in Table 1.

Laboratory examinations

A corneal culture yielded *S. mitis* growth.

Imaging examinations

Not applicable.

FINAL DIAGNOSIS

An impending perforated corneal ulcer was caused by *S. mitis*.

TREATMENT

Famciclovir (250 mg, two tablets, TID), topical tobramycin ointment (3.5 g/tube, BID), and levofloxacin (0.5%, 25 mg/5 mL/bottle, Q1H) were prescribed initially. A subsequent corneal culture yielded *S. mitis* growth. Therefore, hourly topical vancomycin (25 mg/mL) and ceftriaxone (25 mg/mL) were initiated in place of the previous antiviral and antimicrobials based on the susceptibility test. AMT was performed after 2 wk of topical vancomycin and ceftriaxone.

OUTCOME AND FOLLOW-UP

The size of the descemetocoele initially increased to 3 mm in diameter and was accompanied by the development of a 1 mm hypopyon. With the continuous administration of topical vancomycin and ceftriaxone for 2 wk, the descemetocoele gradually decreased to 0.8 mm × 0.8 mm, and the hypopyon resolved (Figure 1B). Superficial manual keratectomy with AMT was performed[9] due to the minimal healing and the lack of further shrinkage of the descemetocoele despite intensive topical antibiotic treatment (Figure 1C).

During the course of the corneal ulcer treatment, the patient reported an abrupt onset of left eye redness with abundant discharge. Pterygium at eight o'clock of the cornea and 360° chemosis with conjunctival injection (OS) were found. Topical sulfamethoxazole (4%, TID) and fluorometholone (0.1%, QID) were used, but the symptoms persisted. Therefore, the diagnostic aspiration of aqueous (OS) was performed. Fortunately, neither viral DNA nor organism was identified, and the severity of the chemosis and conjunctival injection gradually improved afterwards.

In a postoperative clinic follow-up, the amniotic membrane remained in situ without further epithelial defects or leakage at 6 mo post-AMT (Figure 1D). We switched the topical antibiotics to 0.5% levofloxacin and gradually tapered the dose. The cornea gradually healed with faint subepithelial haze as demonstrated by slit lamp biomicroscopy (Figure 2A) and anterior segment optical coherence tomography (Figure 2B), and best corrected VA was 100/200 at the last follow-up, 67 mo after the AMT was performed.

DISCUSSION

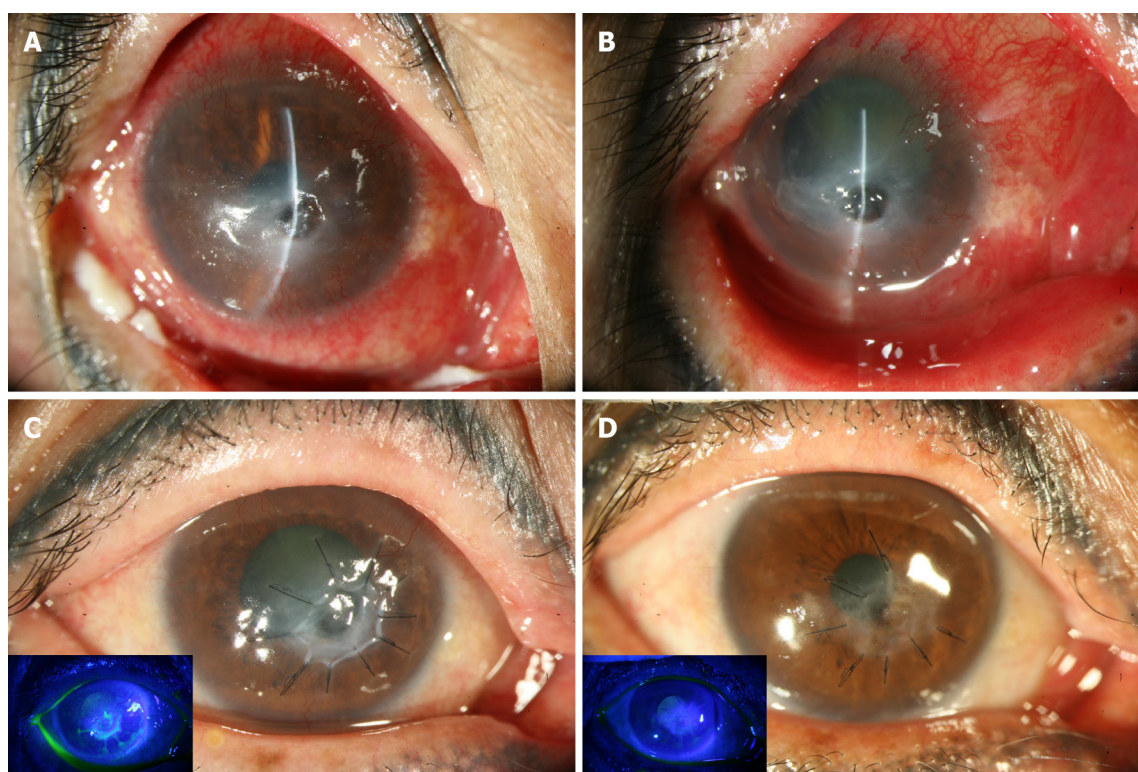
Well-documented treatments of *S. mitis* keratitis are rare, and most of the reported cases had poor visual outcomes or were treated with PK that were reported several years ago[3,5,10]. *S. mitis* is a normal flora of the human oropharynx and is also found on the skin, in the gastrointestinal tract, and in the female genital tract. Despite having low virulence and pathogenicity, reports have shown that *S. mitis* can cause severe infections, including endophthalmitis, infective endocarditis, bacteremia, upper respiratory tract infection, and meningitis[1,2]. This organism has been identified in patients with postsurgical endophthalmitis that resulted in poor visual outcomes[11]. In addition, the viridans group streptococci is one of the most common organisms implicated in the rare corneal infectious disease infectious crystalline keratopathy[12]. Although corneal ulcers caused by *S. mitis* have seldom been described, we treated the impending perforated ulcer with antibiotics for 2 wk before performing AMT.

Previously, in a 10-year review of microbial keratitis from 1972 to 1981, *S. mitis* was reported in 7% (3/44) of polymicrobial keratitis cases and in less than 5% of the 133 cases of monomicrobial keratitis[3]. The vision of one patient was limited to 2/200 by corneal scarring after antibacterial and antifungal therapies. The final vision of another patient was 10/200[3]. In 2005, there was a case report of a 39-year-old woman who presented with an *S. mitis* corneal ulcer with total corneal opacification and a 2.5 mm ×

Table 1 Visual acuity change 2 wk before and after amniotic membrane transplantation

Weeks after AMT		OD	OS
-2	VA	CF/15 cm	0.5
1.6	VA	CF/10 cm	0.4-2
3.6	VA	HM/60 cm	0.3
6.6	VA	CF/80 cm	0.3
12.6	VA	CF/30 cm	0.5
20.6	VA	CF/20 cm	0.5
29.6	VA	CF/10 cm	0.7-2
37.6	VAcPG	0.05	1
54.6	VAcPG	CF/30 cm	1
63.6	VAcPG	CF/20 cm	0.8
73.6	VA	0.08	0.3
268.0	VA	100/200	0.5

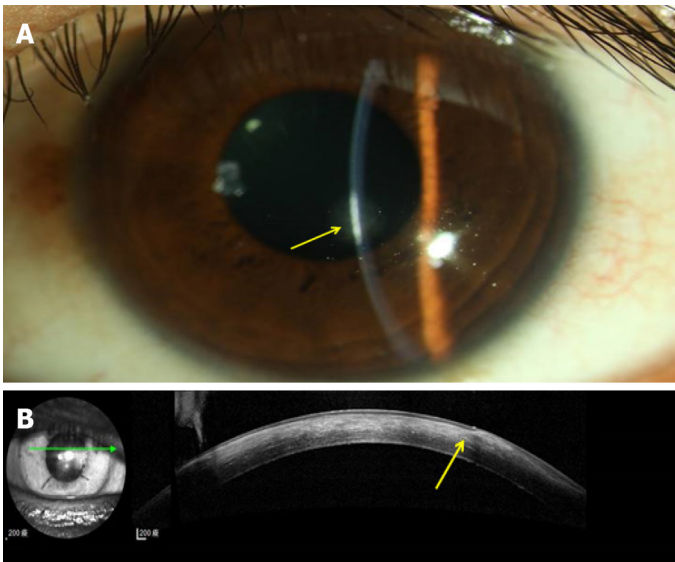
AMI: Amniotic membrane transplantation; VA: Visual acuity; VAcPG: Visual acuity with glasses; OD: Oculus dexter; OS: Oculus sinister.



DOI: 10.12998/wjcc.v10.i12.3923 Copyright ©The Author(s) 2022.

Figure 1 External eye photograph of the cornea before and after treatment. A: At the initial ocular examination, a 3 mm × 2 mm central epithelial defect with stromal infiltration and a 1 mm × 1 mm inferonasal paracentral descemetocoele were observed; B: After the continuous administration of topical vancomycin and ceftriaxone for 2 wk, the descemetocoele gradually decreased to 0.8 mm × 0.8 mm, and the hypopyon resolved; C: After manual superficial keratectomy combined with amniotic membrane transplantation (AMT), the descemetocoele was successfully repaired with smooth epithelialization; D: During the postoperative follow-up, the AM remained in situ without further epithelial defects or leakage at 9 mo.

2.5 mm descemetocoele. Antibiotics were used, but eventually, it progressed to a perforated cornea and was successfully treated with PK with a final VA of 20/200[4]. In 2016, another case was published of an *S. mitis/oralis* corneal ulcer that occurred 1 year after corneal transplantation. Although broad-spectrum antibiotics were given and infection was controlled, the corneal graft was complicated by scar formation. Re-grafting was subsequently performed, and the new graft remained clear[5].



DOI: 10.12998/wjcc.v10.i12.3923 Copyright ©The Author(s) 2022.

Figure 2 Anterior segment imaging of the cornea 67 mo after amniotic membrane transplantation. A: The patient's right cornea was intact with subepithelial opacity, of which a close-up view is shown in an insert (arrow); B: On anterior segment optical coherence tomography, there was hyperreflectivity in the anterior stroma (arrow).

Giving initial topical empiric broad-spectrum antibiotics before available culture data is the general treatment of suppurative keratitis. Surgical treatment options include tissue adhesives, tarsorrhaphy, conjunctival flaps, and PK[13]. The management of a perforated corneal ulcer or descemetocoe involves the repair of the mechanical disruption and the promotion of reepithelization while reducing inflammation[13]. AMT is an alternative treatment for reconstructing the ocular surface, and it has been proposed to be antimicrobial, to promote epithelial healing, and to reduce neovascularization, inflammation, and scarring[6,7].

AM is the innermost layer of the placenta composed of epithelium, basement membrane, and stroma. It was first used in ocular surface reconstruction in 1940 by de Rötth[14]. Later, few ophthalmologists adopted AM for surgery until Batlle and Perdomo used it for conjunctival reconstruction in the 1990s [15]. AMT can provide a physical barrier against infection and retention of antibiotics[16] and has antimicrobial properties *via* human beta-defensins[17], elafin[18], leukocyte protease inhibitor[19], and cystatin E[20]. In a rabbit model, AM was proven to subside pseudomonas keratitis[21]. A previous report also showed the effectiveness of AM in the treatment of infectious corneal ulcer[22].

As for mechanism of epithelial healing, the basement membrane of AM is similar to the conjunctiva that is mainly composed of type IV, V, and VII collagen that help the adhesion, migration, growth, and differentiation of epithelial progenitor cell[23,24]. The AM stroma contains several growth factors such as epidermal growth factor, hepatocyte growth factor, and basic fibroblast growth factor supporting epithelization[25-27]. In addition, protease inhibitors and heavy chain-hyaluronan/pentraxin 3 decrease the local inflammation and scarring[28,29]. In a recent meta-analysis, adjuvant AMT for infectious keratitis showed the promotion of corneal healing and the improvement of uncorrected VA[30].

The documented treatment for corneal ulcer caused by *S. mitis* was PK. While PK can resolve the pathology, it has the disadvantage of limited source of grafts and potential complications such as astigmatism, epithelial defects, and graft failure[8,9]. Considering the mechanism and effectiveness of AMT in infectious keratitis though not in *S. mitis*, we adopted AMT to treat the patient's chronic infectious corneal ulcer. The patient's final VA was good.

Comparing to documented treatment, PK for corneal ulcer caused by *S. mitis*, several studies have reported that AMT is effective in promoting corneal ulcer healing and in preventing corneal perforation in infectious keratitis though not in *S. mitis*. We presented a case of corneal ulcer caused by *S. mitis* treated by topical antibiotics with adjuvant AMT.

CONCLUSION

In this case, we described the clinical and treatment course of an impending perforated corneal ulcer caused by *S. mitis*. We also demonstrated that treatment with antibiotics and AMT was successful, without the need for PK, and this could be considered an alternative treatment for nonhealing descemetocoeles induced by *S. mitis*, as compared to the previous treatment[3-5]. Given the current single case report, larger-scale studies are needed for AMT to become a standard treatment modality for

persistent corneal ulcers prior to PK.

ACKNOWLEDGEMENTS

The authors thank the advice from Dr. Scheffer CG Tseng at the Ocular Surface Center, Miami, FL, United States.

FOOTNOTES

Author contributions: Hsiao FC conducted the literature search, collected the data, interpreted the data, and prepared the manuscript; Meir YJ and Yeh LK collected the data and interpreted the data; Tan HY and Hsiao CH interpreted the data and edited the manuscript; Ma HK and Wu WC interpreted the data and critically revised the draft; Chen HC designed the study, interpreted the data, edited the manuscript, and critically revised the draft.

Informed consent statement: Written informed consent was obtained from the patient for the publication of this case report and any accompanying images.

Conflict-of-interest statement: The authors have no conflicts of interest relevant to this article.

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 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: <https://creativecommons.org/licenses/by-nc/4.0/>

Country/Territory of origin: Taiwan

ORCID number: Fang-Chi Hsiao 0000-0002-4543-3198; Yaa-Jyuhn James Meir 0000-0002-8562-5995; Lung-Kun Yeh 0000-0003-1925-2059; Hsin-Yuan Tan 0000-0002-6210-9912; Ching-Hsi Hsiao 0000-0001-5745-9371; David Hui-Kang Ma 0000-0003-1847-8961; Wei-Chi Wu 0000-0003-3760-7255; Hung-Chi Chen 0000-0002-1117-7878.

S-Editor: Ma YJ

L-Editor: A

P-Editor: Ma YJ

REFERENCES

- Mitchell J. *Streptococcus mitis*: walking the line between commensalism and pathogenesis. *Mol Oral Microbiol* 2011; **26**: 89-98 [PMID: 21375700 DOI: 10.1111/j.2041-1014.2010.00601.x]
- Chung JK, Lee SJ. *Streptococcus mitis/oralis* endophthalmitis management without phakic intraocular lens removal in patient with iris-fixated phakic intraocular lens implantation. *BMC Ophthalmol* 2014; **14**: 92 [PMID: 25023762 DOI: 10.1186/1471-2415-14-92]
- Jones DB. Polymicrobial keratitis. *Trans Am Ophthalmol Soc* 1981; **79**: 153-167 [PMID: 7342399]
- Hsu VJ, Affeldt J, Blanton C. *Streptococcus Mitis* Corneal Ulcer. *Invest Ophthalmol Vis Sci* 2005; **46**: 2632
- Khan ID, Sati A, Arif S, Mehdi I, Bhatt P, Jain V, Konar J, Sahu C, Kumar Ramphal S, Pandit P. *Streptococcus Mitis/Oralis* Corneal Ulcer After Corneal Transplantation. *J Basic Clin Med* 2016; **5**: 8-10
- Hick S, Demers PE, Brunette I, La C, Mabon M, Duchesne B. Amniotic membrane transplantation and fibrin glue in the management of corneal ulcers and perforations: a review of 33 cases. *Cornea* 2005; **24**: 369-377 [PMID: 15829790 DOI: 10.1097/01.icc.0000151547.08113.d1]
- Kim JS, Kim JC, Hahn TW, Park WC. Amniotic membrane transplantation in infectious corneal ulcer. *Cornea* 2001; **20**: 720-726 [PMID: 11588424 DOI: 10.1097/00003226-200110000-00010]
- Chen JH, Ma DH, Tsai RJ. Amniotic membrane transplantation for pseudomonal keratitis with impending perforation. *Chang Gung Med J* 2002; **25**: 144-152 [PMID: 12022734]
- Chen HC, Tan HY, Hsiao CH, Huang SC, Lin KK, Ma DH. Amniotic membrane transplantation for persistent corneal ulcers and perforations in acute fungal keratitis. *Cornea* 2006; **25**: 564-572 [PMID: 16783145 DOI: 10.1097/01.icc.0000227885.19124.6f]
- Cristina N, Slzabela S, Ivan Ozana I. Complicated corneal ulcer. Case report. *Rom J Ophthalmol* 2017; **61**: 239-243 [DOI: 10.22336/rjo.2017.43]
- Durand ML. Endophthalmitis. *Clin Microbiol Infect* 2013; **19**: 227-234 [PMID: 23438028 DOI: 10.1111/1469-0691.12118]

- 12 **Khater TT**, Jones DB, Wilhelmus KR. Infectious crystalline keratopathy caused by gram-negative bacteria. *Am J Ophthalmol* 1997; **124**: 19-23 [PMID: [9222227](#) DOI: [10.1016/s0002-9394\(14\)71638-1](#)]
- 13 **Dakhil TAB**, Stone DU, Gritz DC. Adjunctive Therapies for Bacterial Keratitis. *Middle East Afr J Ophthalmol* 2017; **24**: 11-17 [PMID: [28546687](#) DOI: [10.4103/meajo.MEAJO_264_16](#)]
- 14 **de Rötth A**. Plastic Repair of Conjunctival Defects with Fetal Membranes. *JAMA Ophthalmol* 1940; **23**: 522-525 [DOI: [10.1001/archophth.1940.00860130586006](#)]
- 15 **Battle J**, Perdomo F. Placental membranes as a conjunctival substitute. *Ophthalmology* 1993; **100**: 107
- 16 **Ramuta TŽ**, Starčič Erjavec M, Kreft ME. Amniotic Membrane Preparation Crucially Affects Its Broad-Spectrum Activity Against Uropathogenic Bacteria. *Front Microbiol* 2020; **11**: 469 [PMID: [32265889](#) DOI: [10.3389/fmicb.2020.00469](#)]
- 17 **Mao Y**, Hoffman T, Singh-Varma A, Duan-Arnold Y, Moorman M, Danilkovitch A, Kohn J. Antimicrobial Peptides Secreted From Human Cryopreserved Viable Amniotic Membrane Contribute to its Antibacterial Activity. *Sci Rep* 2017; **7**: 13722 [PMID: [29057887](#) DOI: [10.1038/s41598-017-13310-6](#)]
- 18 **Niknejad H**, Peirovi H, Jorjani M, Ahmadiani A, Ghanavi J, Seifalian AM. Properties of the amniotic membrane for potential use in tissue engineering. *Eur Cell Mater* 2008; **15**: 88-99 [PMID: [18446690](#) DOI: [10.22203/ecm.v015a07](#)]
- 19 **King AE**, Paltoo A, Kelly RW, Sallenave JM, Bocking AD, Challis JR. Expression of natural antimicrobials by human placenta and fetal membranes. *Placenta* 2007; **28**: 161-169 [PMID: [16513165](#) DOI: [10.1016/j.placenta.2006.01.006](#)]
- 20 **Ni J**, Abrahamson M, Zhang M, Fernandez MA, Grubb A, Su J, Yu GL, Li Y, Parmelee D, Xing L, Coleman TA, Gentz S, Thotakura R, Nguyen N, Hesselberg M, Gentz R. Cystatin E is a novel human cysteine proteinase inhibitor with structural resemblance to family 2 cystatins. *J Biol Chem* 1997; **272**: 10853-10858 [PMID: [9099741](#) DOI: [10.1074/jbc.272.16.10853](#)]
- 21 **Dallal MMS**, Nikkhahi F, Imeni SM, Molaei S, Hosseini SK, Kalafi Z, Yazdi SS, Mirzaei HMA. Amniotic Membrane Transplantation for Persistent Epithelial Defects and Ulceration due to Pseudomonas Keratitis in a Rabbit Model. *J Ophthalmic Vis Res* 2021; **16**: 552-557 [DOI: [10.18502/jovr.v16i4.9744](#)]
- 22 **Yin HY**, Cheng AMS, Tighe S, Kurochkin P, Nord J, Dhanireddy S, Swan R, Alpert S. Self-retained cryopreserved amniotic membrane for treating severe corneal ulcers: a comparative, retrospective control study. *Sci Rep* 2020; **10**: 17008 [PMID: [33046729](#) DOI: [10.1038/s41598-020-73672-2](#)]
- 23 **Fukuda K**, Chikama T, Nakamura M, Nishida T. Differential distribution of subchains of the basement membrane components type IV collagen and laminin among the amniotic membrane, cornea, and conjunctiva. *Cornea* 1999; **18**: 73-79 [PMID: [9894941](#)]
- 24 **Shao C**, Sima J, Zhang SX, Jin J, Reinach P, Wang Z, Ma JX. Suppression of Corneal Neovascularization by PEDF Release from Human Amniotic Membranes. *Invest Ophthalmol Vis Sci* 2004; **45**: 1758-1762 [DOI: [10.1167/iops.03-0882](#)]
- 25 **Mahbod M**, Shahhoseini S, Khabazkhoob M, Beheshtnejad AH, Bakhshandeh H, Atyabi F, Hashemi H. Amniotic Membrane Extract Preparation: What is the Best Method? *J Ophthalmic Vis Res* 2014; **9**: 314-319 [PMID: [25667731](#) DOI: [10.4103/2008-322X.143367](#)]
- 26 **Mamede AC**, Botelho MF. Amniotic membrane: origin, characterization and medical applications: Springer; 2015: IX, 254 [DOI: [10.1007/978-94-017-9975-1](#)]
- 27 **Stachon T**, Bischoff M, Seitz B, Huber M, Zawada M, Langenbucher A, Szentmáry N. [Growth Factors and Interleukins in Amniotic Membrane Tissue Homogenate]. *Klin Monbl Augenheilkd* 2015; **232**: 858-862 [PMID: [25581044](#) DOI: [10.1055/s-0034-1383393](#)]
- 28 **He H**, Li W, Tseng DY, Zhang S, Chen SY, Day AJ, Tseng SC. Biochemical characterization and function of complexes formed by hyaluronan and the heavy chains of inter-alpha-inhibitor (HC*HA) purified from extracts of human amniotic membrane. *J Biol Chem* 2009; **284**: 20136-20146 [PMID: [19491101](#) DOI: [10.1074/jbc.M109.021881](#)]
- 29 **Shay E**, He H, Sakurai S, Tseng SC. Inhibition of angiogenesis by HC·HA, a complex of hyaluronan and the heavy chain of inter- α -inhibitor, purified from human amniotic membrane. *Invest Ophthalmol Vis Sci* 2011; **52**: 2669-2678 [PMID: [21228375](#) DOI: [10.1167/iops.10-5888](#)]
- 30 **Ting DSJ**, Henein C, Said DG, Dua HS. Amniotic membrane transplantation for infectious keratitis: a systematic review and meta-analysis. *Sci Rep* 2021; **11**: 13007 [PMID: [34155280](#) DOI: [10.1038/s41598-021-92366-x](#)]



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>

