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Case Report
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Facial Herpes Zoster Accompanied by Herpes Zoster Conjunctivitis Caused by *Dolosigranulum Pigrum*

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Abstract

Dolosigranulum pigrum is considered as an emerging opportunistic pathogen. It was isolated from a patient with facial herpes zoster accompanied by herpes zoster conjunctivitis and identified by 16S rRNA DNA sequence analysis. Furthermore, literature data were collected together to describe the characteristics of *D. pigrum* and the infections.

Keywords: *Dolosigranulum pigrum*; conjunctivitis; 16S rRNA DNA sequencing

Introduction

Dolosigranulum pigrum is catalase-negative gram-positive cocci arranged in pairs, tetrads, and clusters and usually colonize the normal floras of the oral cavity, the skin, and the respiratory and alimentary tracts [1]. However, there have been very few reports about this bacterium. Here we report *D. pigrum* associated with a facial herpes zoster accompanied by herpes zoster conjunctivitis in a patient hospitalized in China, and summarize literature data to describe the characteristics of *D. pigrum* and the infections.

Case Presentation

A 92-year-old female was hospitalized in May 2015 suffered from facial erythema, blisters and pain for 2 days. She had several underlying diseases including hypertension, coronary heart disease, and diabetes. She firstly visited the Department of Dermatology and was diagnosed as facial herpes zoster with follows symptoms: patchy edema erythema was observed along the trigeminal nerve and covered by cluster of blisters; the diameters of the blisters were between 0.2 mm and 0.4 mm, local exudation and crusting with a small amount of purulent secretion. The patient then visited the Department of Ophthalmology and was further diagnosed as herpes zoster conjunctivitis in right eye. No other abnormal condition was observed among the examination of blood routine, urine routine, liver function, renal function, blood lipids, myocardial enzymes, and electrolytes, excepting abnormal glucose content in blood (6.92 mmol/L).

Purulent secretion from herpes were collected and sent to bacterial culture. The secretion yielded gram-positive cocci after 2-day incubation at 37°C on 5% sheep-blood agar under anaerobic atmosphere. Biochemical testing gave a positive result of α hemolysis and a negative result for production of catalase. The cocci were identified by using the BD Phoneix-100 system (Becton Dickinson, New Jersey, USA) as *Alloiococcus otitis*, by using VITEK 2-compact system (bioMérieux, Lyons, France)as *Micrococcus Kristinae*, and by using matrix-assisted laser desorption/ionization time of flight (MALDI-TOF) mass spectrometry (Bruker, Leipzig, Germany) as "not reliable identification". Sequencing the 16S rDNA PCR product obtained from the isolate yielded 1406/1419 bases (99%) sequence similarity with the homologous sequence of *D. pigrum* reference strain (Gen Bank accession no. X70907.1) by BLAST analysis.

The *D. pigrum*strain was susceptible to moxifloxacin, cefuroxime, penicillin G, vancomycin, cefotaxime, ceftriaxone, linezolid, meropenem, but was intermediate to oxacillin and resistant to erythromycin and clindamycin. The antimicrobial pattern of our strain is similar to those of other study. Previous studies showed *D. pigrum* isolates were sensitive most tested drugs, but resistant to erythromycin and/or clindamycin [2-6].

The patient was received azithromycin injection (0.5 g, one time/day), local wet dressing with benzalkonium chloride solution, extract from rabbit skin inflamed by vaccinia vaccine injection(3.6 iu, one time/day), oral vitamin B1 (10 mg, three times/day), mecobalamin tablets (500 μg, three

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Table 1: Information of 33 cases of *D. pigrum*-related infections reported in 8 publications and here.

No.	Source	Clinical diagnosis	Age	Sex	Year	Locale	References
1	Spinal cord	Multiple sclerosis	Unknown	Unknown	Unknown	England	2
2	Eye	Unknown	43 yr	M	1980	South Dakota, USA	2
3	Sputum	Pneumonia	Unknown	M	1986	South Dakota, USA	2
4	Eye	Eye disease (Blepharitis)	74 yr	M	1990	Nebraska, USA	2
5	Blood	Unknown	80 yr	F	1991	Michigan, USA	2
6	Blood	Sepsis	Unknown	Unknown	1992	North Carolina, USA	2
7	Eye	Unknown	76 yr	F	1994	New York, USA	2
8	Blood	Sepsis	1.2 yr	F	1994	North Carolina, USA	2
9	Sinus	Sinusitis	3 yr	M	Unknown	Canada	2
10	Blood	Unknown	Unknown	Unknown	1995	Canada	2
11	Urine	Unknown	85 yr	M	1995	Canada	2
12	Eye	Unknown	50 yr	F	1996	New York, USA	2
13	Eye	Unknown	83 yr	F	1996	New York, USA	2
14	Blood	Sepsis	66 yr	F	1997	South Carolina, USA	2
15	Blood	Unknown	63 yr	M	1997	Canada	2
16	Blood	Unknown	78 yr	M	1997	Georgia, USA	2
17	Blood	Unknown	Unknown	M	1998	Georgia, USA	2
18	Blood	Sepsis	2 mo	M	1998	South Carolina, USA	2
19	Blood	Unknown	11 yr	M	1998	Tennessee, USA	2
20	Eye	Unknown	2 mo	F	1998	Georgia, USA	2
21	Blood	Sepsis	2 mo	M	1998	Missouri, USA	2
22	Stomach	Unknown	79 yr	F	1999	Canada	2
23	Blood	Unknown	1.8 yr	F	1999	Georgia, USA	2
24	Blood	Synovitis	64 yr	M	2000	Ohio, USA	3
25	Blood	Cholecystitis and pancreatitis	76 yr	M	2005	Taiwan, China	4
26	Bronchial aspirate	Pneumonia	51 yr	M	2006	Nijmegen, The Netherlands	7
27	Blood and bronchoalveolar lavage fluid	Nosocomial pneumonia and septicemia	71 yr	M	2006	Paris, France	5
28	Synovial biopsy specimen	Arthritis	64 yr	M	2006	Bærum, Norway	8
29	Eye (corneal scraping)	Eye disease (Keratitis)	78 yr	F	2007	Marseille, France	6
30	Eye (corneal scraping)	Eye disease (Keratitis)	85 yr	M	2011	Marseille, France	6
31	Eye (corneal scraping)	Eye disease (Keratitis)	71 yr	F	2012	Marseille, France	6
32	Eye (Conjunctival swabs)	Eye disease (Phlyctenular keratoconjunctivitis)	2 yr	F	Unknown	New York, USA	9
33	purulent secretion	Eye disease (Facial herpes zoster and conjunctivitis)	92 yr	F	2015	Hebei, China	This study

times/day). The patient's facial erythema, blisters and pain improved after antibiotic administration and she was considered clinically cured and discharged on the fourth day of hospitalization.

We collected 33 *D. pigrum* infection cases reported up to now (Table 1) [2-9]. The sex of 29 of them is known and 17 were male. The age of 25 of them is known, ranging from 2 months to 92 years. Seven patients were under 3 years and 17 patients were over 60 years, suggesting this *D. pigrum* more easily infected infants and the elderly people, regardless of gender. *D. pigrum* were isolated from blood of 15 patients and eye of 10 patients. The isolates of remaining eight patients were from spinal cord (n=1), sputum (n=1), sinus (n=1), urine (n=1), stomach (n=1), bronchial aspirate (n=1), synovial biopsy (n=1), purulent secretion (n=1). The clinical diagnosis of 20 of them is known. They were diagnosed as eye diseases (n=6), sepsis (n=5), pneumonia (n=3, one of them was complicated by septicemia), sinusitis (n=1), arthritis (n=1), synovitis (n=1), acute cholecystitis accompanied by acute pancreatitis (n=1).

Discussion

D. pigrum is difficult to identify *D. pigrum* by using commercial systems because the profiles generated by *D. pigrum* are not included in the databases provided by the manufacturers. In previous reports, the API system (bioMérieux) wrong identified *D. pigrum* as *Gemella* species [5,7]. In this study, by using the BD Phoneix-100 system, VITEK 2 system and the Bruker Daltonik MALDI Biotyper, we were unable to identify *D. pigrum*.16S rRNA gene sequencing is the effective method to identify *D. pigrum*, as confirmed by here and previous reports [4-9].

D. pigrum is considered as an emerging opportunistic pathogen [6,10]. It can cause a wide spectrum of disease. However, this bacterium is rarely described, and little is known about its habitat and pathogenicity. Because of the invalid of conventional biochemical identification systems and the MALDI-TOF Mass spectrometry identification system, appropriate molecular methods should be developed and used to determine the *D. pigrum* infection.

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