

The Importance of Cutting-Edge Technology in Diagnosis and Management of Trichosporonosis Case in Children

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Abstract

Trichosporonosis is an uncommon infection. It is a fatal mycosis infection for immunocompromised patients. It is very important to treat the rare case on soft tissues of children's oral cavity. The supporting examinations with sophisticated equipments are needed in order to achieve the right treatment. This study aims to report the management of trichosporonosis case in children. A 5-year-old girl who was referred by a pediatricist with diagnosis of pneumonia came to the oral medicine department of Dr. Ramelan Naval Hospital Surabaya with chief complaints of burning mouth syndrome and swallowing difficulty. Based on the history taking, the patient was born prematurely, and ever had febrile convulsions. Previous diagnosis was Primary Herpetic Gingivostomatitis combined with Oral Thrush. Patient had received nystatin but did not show any good responses. The patient was then subjected to a mycological examination. Through the ViteK®2 compact automatic microorganism identification tool, the final diagnosis was Trichosporonosis mucoides caused by pneumonitis.

The medicament she got were matched with the fixed diagnosis, and she was cured optimally. By conducting an intensive history taking, general physical examination, and supporting examinations with the latest technology, the handling of fungal infections in the soft tissues of the oral cavity can be managed appropriately with optimal results.

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Introduction

Infection is the invasion of microorganism into tissue or body fluids accompanied by clinical symptoms, both local and systemic. The causes of infection can come from a variety of viruses, bacteria, and fungi.¹ The most common fungal infections found in the oral cavity are *Candida* species. Infections caused by *Candida* species are known as Oral Candidiasis.²

Apart from *Candida* species, *non-Candida* species were also found. Several types

of *non-Candida* fungi, including *Aspergillus* species, *Mucormycosis* and *Trichosporon* species.¹ Based on morphological, biochemical, and molecular studies, *Trichosporon* fungi are divided into several types, including: *Trichosporon asahii*, *Trichosporon inkin*, *Trichosporon cutaneum*, *Asteroid trichosporon*, *Trichosporon ovoides*, *Trichosporon pullulans*, *Trichosporon loubieri*, *Trichosporon japonicumides*, *Trichosporon mucoides*, and others. This species of *Trichosporon mucoides* is quite rare and can be pathogenic in humans in the presence of immunocompromised factors. This infection is known as *Trichosporonosis*.³

There are two predisposing factors or trigger factors that cause fungal infections to become pathogenic, namely local and systemic factors. As for local factors, such as: poor Oral Hygiene (OH), smoking, and improper use of

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removable dentures. While systemic factors are the use of corticosteroids and antibiotics in the long term, patients with uncontrolled Diabetes Mellitus, xerostomia, HIV/AIDS (Human Immunodeficiency/ Acquired immunodeficiency Syndrome) sufferers, the presence of malignancy, as well as age factors (can be in old age or young age).⁴

Comprehensive, fast, and precise management is needed when *Trichosporonosis* occurs in the oral cavity of immunocompromised children. The children can not eat because of the pain. While children need nutrition for growth and development. Besides, *Trichosporonosis* is a fatal mycosis for immunocompromised patients.⁵

To determine the right final diagnosis, a fast and accurate supporting examination is needed. Through the latest technology in the form of an automatic microorganism identification tool VITEK®2 COMPACT, the results obtained were *non-Candida* type fungi with *Trichosporon mucoides* species.⁶

The purpose of writing this case report was to report the integrated management of cases of *Trichosporonosis* infection in immunocompromised children at Dr. Ramelan Naval Medical Center Hospital Surabaya. With this case report, it was hoped that it can add insight to colleagues about *non-Candida* fungal infections in the oral cavity.

Case Report

A 5-year-old girl who was accompanied by her mother came to the OM (Oral Medicine) clinic, dental and oral department of Dr. Ramelan Naval Medical Center Hospital Surabaya. The patient came from a pediatric polyclinic referral, with the main complaint of burning and pain in her oral cavity. This caused the patient did not want to eat because it was difficult to swallow. General condition of the patient looked weak and pale because in addition to the pain in the mouth, there were also headache and nauseous stomach. The patient's height was 85 cm (centimeter) with a weight of 14 kg (kilo grams). So, she looked skinny.

The patient's mother said that 3 days ago the patient was hospitalized in the pediatric outpatient ward at Dr. Ramelan Naval Medical Center Hospital Surabaya with a diagnosis of Thyroid fever and Pneumonitis. Her daughter had a cough and had pneumonia. The patient had a history of premature birth. During

hospitalization the patient received RL (Ringer lactate) infusion therapy, ceftriaxone injection, antrain injection, oradexone injection, mexam tablets and Ventolin nebulas.

On Extra Oral (EO) examination, the upper lip showed edema and redness. Meanwhile, the lower lip showed erosion and desquamation. The right and left submandibular glands were palpable, supple, movable and slightly painful.

On Intra Oral (IO) examination, there was gingivitis accompanied by gangrene radix on anterior teeth. Poor Oral Hygiene detected. On the dorsum of the tongue visible white plaque, with a unique pattern, could be scraped, and left a reddish area. Ulcers were also found, multiple, round, varying in size from 1-7 mm, covered with a white pseudomembrane layer, and painful. On the mucosa of the lower lip there were ulcers, multiple, irregular in shape with white areas bordered. (Figure 1)

The provisional diagnosis was suspected Acute pseudomembranous candidiasis with predisposing factors from pneumonitis with Differential Diagnosis (DD) was Acute Primary Herpetic Gingivostomatitis combined with oral thrush. By reason of the patient's oral cavity found Stomatitis and Gingivitis.



Figure 1. The upper jaw revealed Gingivitis with gangrene radix on the anterior teeth. In the lower jaw there was gingivitis due to plaque on the anterior teeth. (A) Dorsal tongue: white plaque with a unique pattern, could be scraped off, and left a reddish color, and painful. Ulcers were also found, multiple, rounded, varying in size from 1-7 mm, covered with a white pseudomembrane layer, and painful (B) Lower labial mucosa: ulcers, multiple, oval, varying in diameter of 5-10 mm, surrounded by a whitish color and painful (C).

Case management on that day, including non-pharmacological and pharmacological treatments. For non-pharmacology, patients were performed KIE (Communication, Instruction, and Education) by giving instructions to brush their teeth properly, to brush the tongue with a soft toothbrush without toothpaste, to avoid

stimulating foods such as spicy, hot, and rough. Another important instruction was to consume foods with a high Calorie and high protein diet.

For pharmacological therapy, the patient was prescribed Nystatin oral suspension by means of drops and swallowed, multivitamin syrup and analgesic syrup. The patient was then asked to return for control about 7 days later.

Apparently, the patient came for the first control on the third day. This happened because there was still pain and the tongue felt rough. Even though all drugs had been consumed regularly.

On extra oral examination, the right and left submandibular glands showed chronic lymphadenitis. On intra-oral examination on the dorsum of the tongue, the white plaque was slightly thinned, and the area of erosion was accompanied by pain. On the lower labial mucosa, ulcers were still visible with diffuse boundaries, and painful. (Figure 2)

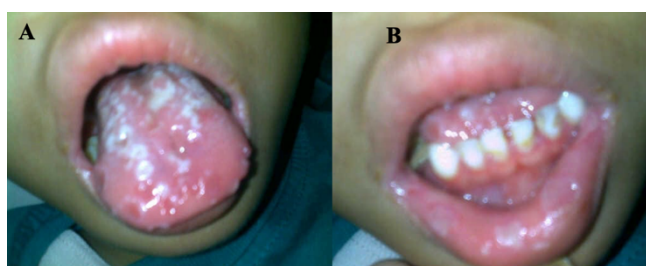


Figure 2. Dorsal tongue: white plaque could be scraped off, and left a reddish color, and painful. There were also areas of erosion, multiple, reddish in color, rounded, varying in size from 2-7 mm, surrounded by a thin white line, and painful (A) Lower labial mucosa: ulcers, multiple, oval, varying in diameter from 5 to 10 mm, with a white ulcerated base, indurated and slightly painful edges (B).

The results of the treatment that day, oral swab was performed on patient, then the swab results were taken to transport media, and referred to Microbiology which was under the auspices of the JANGKLIN (Clinical Support) department, Dr. Ramelan Naval Medical Center Hospital, Surabaya. This was taken, considering that the patient had already received Nystatin oral suspension, which was the procedure of mycositic infection, and did not show response. So, the patient still felt painful and had eating difficulty.

Two days later the patient came for the

third control with the results of an oral swab which showed the role of the fungus *Trichosporon mucoides*. Furthermore, for pharmacological therapy, the patient was given Fluconazole tablets which were made in powder form according to the patient's weight.

At the fourth control, three days after the third control, the patient came back with a face that looked fresher and cheerful. The general condition seemed to be improving and progressing. Regarding complaints, the patient said there were no complaints. The patient could perform all activities that were already running as usual. The patient's parents were satisfied with their daughter's condition. On intra-oral examination seemed to show signs of progress. On dorsal tongue appeared normal, with variations in the presence of fissures, multiple, and painless. (Figure 3)

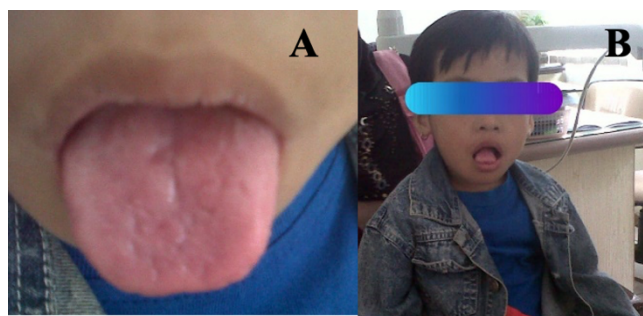


Figure 3. Dorsal tongue condition of patient (A) Patient condition at the fourth control (B).

Thus, the treatment was discontinued. Dental Health Education (DHE) instructions were delivered such as to keep diligently cleaning the tongue, to maintain health by consuming lots of water, to eat vegetables and fruits, and to beware and avoid factors that could trigger the recurrence of the disease.

Discussion

According to anamnesis, the patient and her parents lived in a rural area, in the middle of the city. This patient was born as premature baby. Of course, this assumes that her health in general was not as good as other normal births. She once suffered from seizures at the age of three, then suffered from Pneumonitis. As a toddler, she generally used to play in the outdoor area, where fungal with the species *Trichosporon* are fungal that usually inhabit the soil and other environmental sources, and can colonize in the

intestinal tract and human respiratory tract. This type of fungal can cause superficial infection.⁷

In the presence of predisposing factors in the form of the child's age, poor Oral Hygiene, and also suffered from Pneumonitis. Indicates the child had immunocompromised. This made the recurrence of fungal infections easier, because the immune system was immature.⁸

This child was hospitalized in the pediatric care room of Dr. Ramelan Naval Medical Center Hospital Surabaya, due to a high fever for one week accompanied by a cough that secreted mucus sputum, as well as difficulty of swallowing and burning mouth syndrome. This symptom indicates the presence of fungal infections. With this complaint, the patient was referred to the OM clinic.

Case management on the visit, the first day the patient was given Oral Nystatin suspension therapy which was the procedure of mycositic infection, and showed no response. So that the patient still complained the difficulty of eating, because the mouth hurts. Furthermore, the patient was carried out a supporting examination with oral swab using transport media. And then all lesions were sanitized with betadine solution and afterward continuously using extract aloe vera gel topically.

The supporting examinations that used to see the presence of fungi, could be the method with gram staining, Kalium Hydroxide (KOH) solution, culture examinations with the Saboraud Dextrose Agar (SDA) method, and others.⁹ The methods above were manual methods. Some of these methods had some drawbacks, some methods were not being able to see the type of mushroom species, and relatively took a long time.¹⁰

In the microbiology laboratory under the Clinical Support department of Naval Medical Center Hospital Surabaya has used VITEK® 2 compact, where this tool is the result of the latest development technology and is a highly automatic system tool for identification and antimicrobial sensitivity tests based on the principle of calorimetric technology and measurement of light attenuation associated with each biochemical reaction in a 2- compact VITEK® card, thus enabling the results of time identification in 5-8 hours.¹¹

The latest technology using VITEK® 2 compact facilitates laboratory examination, namely with 3 stages. The 3 stages, namely:

preparation for the standardization of inoculum turbidity, entering data with a barcode system and inserting cards into the tool.¹² Furthermore, the entire process of inoculation, incubation, reading, validation and introduction of results will be carried out automatically by the tool.¹³ The results of the completed inspection can be printed automatically, while the ID (Identification card)/ AST (Antimicrobe Sensitivity Test) card by the system will automatically be thrown into the dump. The results of this examination can also be directly connected to 28 LIS (laboratory information system).¹⁴

VITEK® 2 cards consist of 2 types of cards, namely ID cards for identification and AST for antibiotic sensitivity tests. Each card is equipped with a barcode. VITEK® 2 cards have 600 types of calorimetric test substrates that are very specific to distinguish between species, so that 98% of clinical isolates can be detected with this single system quickly. Each card is equipped with a barcode containing information about the product type, lot number, expiration date, and a unique identifier that can be linked to a sample, either before or after loading the card into the system.¹⁵

Vitek® 2-compact (Biomérieux) has 64 holes, each of which can contain an individual test subtract.¹⁶ The substrate measures various metabolic activities such as acidification, alkalization, enzyme hydrolysis, and growth in the presence of inhibitory substances.^{15,16}

VITEK® 2 compact has software or software that is easy to use. Advanced Expert System is a software that is able to validate and interpret the results of the identification and sensitivity test of bacteria to antimicrobials.¹⁷

By using the latest technology in the form of an automatic microorganism identification tool VITEK®2 compact, the results shown the identification of non-Candida type with *Trichosporon mucoides* species and this fungus is sensitive to fluconazole anti-fungal.¹⁸

Conclusions

Trichosporonosis is an uncommon infection, especially in patients with weak immune system. By performing anamnesis, physical examination, supporting examination using the latest methods, the right treatment can be applied, so that the patient recovers quickly.

Declaration of Interest

The authors report no conflict of interest.

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