Unusual Cause of Acute Sinusitis and Orbital Abscess in COVID-19 Positive Patient

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Abstract

Peptoniphilus indolicus is not usually seen in the eye but is a commensal of the human vagina and gut. However, with COVID-19, eye infections and other unusual complications are possible with unsuspected bacteria. The patient presented here spontaneously drained this bacteria through the skin, an uncommon occurrence with orbital abscesses.

Key Words

COVID-19, Peptoniphilus indolicus, sinusitis, orbital abscess

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Key clinical message: COVID-19 can affect the presence of bacteria within certain anatomical regions. Specifically, Peptoniphilus indolicus is not normally found outside of the vagina or gut biome, but was found in the sinus and orbit of our patient.

Abstract

Background

Peptoniphilus indolicus is not usually seen in the eye but is a commensal of the human vagina and gut. However, with COVID-19, eye infections and other unusual complications are possible with such unsuspected
bacteria. The patient presented here spontaneously drained this bacteria through the skin, an uncommon occurrence with orbital abscesses.

Case Presentation

The patient is a 76-year-old white male from a nursing home tested positive for COVID-19 and was sent from a nursing facility for left eye drainage and psychiatric evaluation. Upon presentation, the patient was not fully oriented and could not provide a history of the eye drainage. CT scan showed sinusitis with left orbital and periorbital abscess formation, cellulitis, and extensive osteomyelitis. He underwent endoscopic transnasal drainage and orbiotomy. Cultures returned positive for MRSA, Streptococcus constellatus, and Peptoniphilus indolicus. He was maintained on several days of IV antibiotics and returned to the nursing home.

Conclusions

Given the concomitant infection with COVID-19 and unusual presentation, the patient’s sinus cultures support the notion that COVID-19 can affect the presence of bacteria within certain anatomical regions. Specifically, Peptoniphilus indolicus is not normally found outside of the vagina or gut biome. Avascular, pale mucosa and bone of the nasal cavity was noted during surgery of this COVID-19 infected patient, which is in contrast to the friable and edematous tissue typically found in acutely infected sinuses. Our patient’s orbital abscess began to drain spontaneously through the skin, which is rare for orbital abscesses.

Background

Peptoniphilus indolicus is not usually seen in the eye but is a commensal of the human vagina and gut. However, with COVID-19, eye infections and other unusual complications are possible with such unsuspected bacteria. The patient presented here spontaneously drained through the skin, an uncommon occurrence with orbital abscesses.

Case Presentation

The patient is a 76-year-old white male who tested positive for COVID-19 but was sent from a nursing facility for left eye drainage and psychiatric evaluation. Upon presentation, the patient was not fully oriented and could not provide a history of the eye drainage. His past medical history is significant for hypertension, Type 2 diabetes mellitus requiring insulin, diabetic ketoacidosis, testicular cancer, and transient ischemic attack. CT scan upon presentation showed sinusitis with left orbital and periorbital abscess formation, cellulitis, and extensive osteomyelitis (Figures 1-3). The margin of the orbital abscess was within the inferior margin of the globe, where there appeared to be an open defect within the globe itself. The patient also had a chest x-ray showing some patchy infiltrates, particularly in the right lung, consistent with a COVID-19 infection.

The patient was admitted and subsequently underwent endoscopic left middle turbinate reduction, endoscopic left maxillary antrostomy with tissue removal, and endoscopic anterior ethmoidectomy with the Otolaryngology service the following day. The patient also underwent left orbiotomy with drainage of the left orbital abscess with the Ophthalmology service that same day. During surgery, his nasal cavity was oddly avascular (Figure 4). The turbinate was edematous but pale. The mucosa did not bleed when manipulated. When the bone of the middle turbinate and medial wall of the maxilla were removed with Tru cut forceps, they did not bleed. The fat of the orbit was pale. Cultures were taken during surgery and returned positive for MRSA, Streptococcus constellatus, and Peptoniphilus indolicus. He completed several days of intravenous antibiotics during the hospitalization but continued to have drainage from his left eye (Figures 5-6). Otolaryngology evaluated him daily and had no plans to do further surgery. He was deemed hemodynamically and neurologically stable and was transferred back to his nursing facility for completion of intravenous antibiotics.

Discussion

Rare disease processes and manifestations have been reported in COVID-19 positive patients. Peptoniphilus indolicus, a type of bacteria normally found in the vagina and stomach1, was found within our patient’s
orbit. There are now more than 15 Peptoniphilus species within the genus, seven of which were discovered in 2012.\textsuperscript{2-9} Still, up until now, none of the 15 species have been seen within the orbit. To date, Peptoniphilus species have most commonly been associated with diabetic skin and soft tissue infections, bone and joint infections, and surgical site infections.\textsuperscript{10-13} A recent study of pre-term labor and early neonatal sepsis also isolated Peptoniphilus from amniotic fluid causing choramnionitis.\textsuperscript{14} Only recently did a case series of Peptoniphilus causing bloodstream infection (BSI), either alone or as part of a polymicrobial infection, become available.\textsuperscript{15} We believe that our case is the first to document Peptoniphilus within the orbit. Physicians should therefore add it to their differential when COVID-19 patients present with sinusitis and orbital abscess. An Infectious Disease team should also be a part of the care team in order to adequately cover unusual organisms.

Of note, the avascularity of the nasal tissue was of significant interest and very peculiar to the surgeons involved with the case. Limb ischemia and avascular surgical fields have been noted during the COVID-19 pandemic, as evidenced in the Italian Lombardy region.\textsuperscript{16} In Lombardy, the incidence of acute limb ischemia (ALI) significantly increased during the COVID-19 pandemic and successful revascularization was lower than expected, believed to be due to a virus-related hypercoagulable state.\textsuperscript{16} As reported by Silingardi and colleagues, the increased thromboembolic complications in COVID-19 patients have been reported even in those receiving anticoagulant therapy and in nonatherosclerotic patients.\textsuperscript{16-19} In turn, precautions must be taken when performing surgery on COVID-19 positive patients, specifically from a vascular standpoint.

Finally, the Ophthalmology service made note of the peculiarity of the spontaneously-draining orbital abscess. Typical orbital abscess presentations include red eye, proptosis, ophthalmoplegia, and pain.\textsuperscript{20-21} In severe cases, the optic nerve can become compressed, leading to compressive optic neuropathy.\textsuperscript{21} The incidence of abscess formation among sinus disease patients varies from 6.25% to 20%, to as high as 78.6%.\textsuperscript{22-25} Rarely, however, does an orbital abscess drain on its own. According to the American Academy of Ophthalmology, current guidelines recommend surgical drainage in conjunction with intravenous antibiotics to achieve complete resolution of the infection in patients over the age of fourteen.\textsuperscript{26} Still, there are very few studies with high power looking at orbital abscess drainage in adults. For example, from a study by Kayhan and colleagues with ten total patients, external drainage of the abscess was needed in six of the patients in the study.\textsuperscript{27} Nevertheless, zero of the six orbital abscesses that needed draining did so spontaneously, further supporting the rarity of the type of orbital abscess found in the COVID-19 positive patient in our study.

Conclusions

Given the concomitant infection with COVID-19 and unusual presentation, the patient’s cultures support the notion that COVID-19 can affect the presence of bacteria within certain anatomical regions. Specifically, Peptoniphilus indolicus is not normally found outside of the vagina or gut biome. Like other parts of the body, the sinonasal cavity can become avascular as a result of COVID infections. It is also rare for orbital abscesses to drain spontaneously, as this abscess did.

List of Abbreviations

Methicillin resistant staph aureus (MRSA), Coronavirus Disease 2019 (COVID-19), Computed tomography (CT), diabetes mellitus (DM), bloodstream infection (BSI), acute limb ischemia (ALI)

Conflicts of Interest: The authors report no relevant financial disclosures related to this current work.

Ethical Considerations: All issues related to ethics were taken into consideration throughout the study design and proposal and implemented during the research study itself.

Consent: Informed consent was obtained by the study patient, beneficence was made a top priority, and respect for confidentiality and privacy were upheld during the study and its various analysis and information assertion components.

References


**Figure Legend**:

Figure 1. Axial sinus CT.

Figure 2. Coronal Sinus CT.

Figure 3. Sagittal Sinus CT.

Figure 4. Endoscopic view of avascular tissue of the left middle meatus. Diamond- left middle turbinate, Star- left maxillary os. Figure 5. Orbital abscess drainage – eye open. Figure 6. Orbital abscess drainage – eye closed.

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