Early Detection and Management of Odontogenic Maxillary Sinusitis: A Systematic Review

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Objectives/ Background
• Odontogenic causes of maxillary sinusitis often go undiagnosed and overlooked, leading to persistent infection and symptoms
• Early studies report an incidence of up to 10-12%, while newer studies report an incidence of 25-40%.
• This study aims to consolidate the emerging data regarding the pathophysiology, clinical symptoms, modern diagnostics and treatment modalities of odontogenic maxillary sinusitis (MS).

Materials and Methods
• A search of all existing English literature including case reports was performed on PubMed, Medline and Scopus databases using the following keywords: “odontogenic sinusitis” and “maxillary sinusitis of dental origin”.

Results

<table>
<thead>
<tr>
<th>Causes</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Evaluation of radiographs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iatrogenic (56-66%)</td>
<td>• Complications of dental extraction (20-48%):</td>
<td>• Higher false negatives</td>
<td>• Periodontal bone loss</td>
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<td></td>
<td>• Oro-antral perforation/ Oro-antral fistula</td>
<td>• Superimposition of the alveolar bone, roots of the maxillary teeth, hard palate and zygomatic process over the sinus floor</td>
<td>• Periapical radiolucencies</td>
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<td></td>
<td>• Root in antrum</td>
<td>• Loss of continuity of periodontal ligament (PDL) space, widened PDL space</td>
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<td>• Endodontic procedures (28%):</td>
<td>• Higher radiation dosage</td>
<td>• Loss of continuity of periodontal ligament (PDL) space, widened PDL space</td>
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<td></td>
<td>• Extrusion of endodontic materials</td>
<td>• Absence of soft tissue information</td>
<td>• Loss of continuity of periodontal ligament (PDL) space, widened PDL space</td>
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<td></td>
<td>• Amalgam remains after apicoectomies</td>
<td>• Noise present can limit observation of fine bone detail</td>
<td>• No bony partition between the root apices and the sinus mucosa</td>
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<td>• Dental implants (3-37%):</td>
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<td>• Roots protruding through the maxillary sinus cortical floor, contacting the sinus mucosa</td>
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<td></td>
<td>• Sinus lift surgery</td>
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<td>• Mucosal thickening &gt; 2mm</td>
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<td></td>
<td>• Incorrect placement of dental implants</td>
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<td></td>
<td>• Bone graft materials</td>
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<td>Periodontal disease (8-40%)</td>
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<td>Apical periodontitis (18-25%)</td>
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<td>Odontogenic cysts (7%): Commonly: Dentigerous cysts, Radicular cysts</td>
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<td>Odontogenic tumours</td>
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<td>Ectopic teeth</td>
<td>Commonly: upper wisdom teeth</td>
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<td>Maxillary osteomyelitis</td>
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</tbody>
</table>

Common clinical symptoms:
• Unilateral nasal congestion
• Unilateral purulent rhinorrhea
• Foul odour and taste
• Headaches
• Unilateral anterior maxillary tenderness
• Dental pain

Note: Patients may experience minimal symptoms if the osteomeatal complex is unobstructed.

Microbiology:
• Polymicrobial, predominantly anaerobes
• Staphylococcus aureus, Peptostreptococcus spp., Fusobacterium spp., pigmented Prevotella, Porphyromonas, Agerupplis spp
• Pseudomonas aeruginosa associated with sinus infections due to foreign bodies

Histology:
• Extensive small papillary folds of the mucosa
• Increased claudin-4 expression in the epithelium
• Lymphocyte and plasma cell–dominant cellular phenotypes and Th17 cytokine profiles.

Conclusion
The management of MS involves treatment of both the sinusitis and the odontogenic cause. Thus, a multidisciplinary approach involving otorhinoiylogists, oral maxillofacial surgeons and radiologists is critical in ensuring optimal patient outcome. Further studies are needed to look into the sequence of dental surgery and ESS.

References

Medications
• Antibiotic therapy (Amoxicillin-Clavulanic acid: first choice, Moxifloxacin: if allergic to penicillins)
• Nasal decongestants • Saline aerosols

Oral surgical
• Extraction
• RCT/ Apicoectomy
• Foreign body removal
• Surgical closure of OAP if > 5mm or persistent for 3 weeks
• Surgical closure of OAF

Endoscopic
• Required in 48-80% of cases
• To open and calibrate the ostium, correct septal deviations or concha bullosa
• Strongest indications: obstruction of the OMU, OAP/OAF, removal of root in antrum
• Caldwell-Luc approach: used when better access to the sinus is needed

Multi-disciplinary management

Dental Panitogram
• Less radiation
• Useful to assess dentition, relationship of the maxillary teeth to the sinus, and extent of pneumatization
• Identification of foreign bodies in the sinus
• Cheapest

Computed Tomography (CT)
• Good resolution
• Able to discern bone and soft tissue

Cone Beam Computed Tomography (CBCT)
• Approximately 10% of the radiation dose of conventional thin-slice CT
• Higher image resolution
• Less stress artefacts than CT
• Shorter scanning time


duplicates removed:

Published before 2000 (n= 176), Non-English literature (n=28), Unable to retrieve full text (n=5)

Conclusion
The management of MS involves treatment of both the sinusitis and the odontogenic cause. Thus, a multidisciplinary approach involving otolaryngologists, oral maxillofacial surgeons and radiologists is critical in ensuring optimal patient outcome. Further studies are needed to look into the sequence of dental surgery and ESS.

References