Antibiotic Delivery Systems for Oral Infections

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One of the main causes of oral pain is infection in the mouth. The infections can be intraoral or in pockets between the gums and the teeth. Infection in the gum pockets is called periodontitis. Oral infections can cause pain and tooth loss if left untreated and can have other side effects. Systemic or local delivery of the antibiotics can be used for these infections and there are some advantages and disadvantages to each. Studies comparing the types and method of delivery of antibiotics were analyzed. Antibiotic treatment was found to be most effective when combined with scaling and root planing (SRP). However, it was found that current antibiotic treatments only temporarily treat the problem and are not effective at completely eliminating the infections. New delivery systems and technological advancements in medicine need to be developed to effectively and completely treat these infections.

### Antibiotic Treatment of Periodontitis

<table>
<thead>
<tr>
<th>Need</th>
<th>Metric</th>
<th>Local</th>
<th>Systemic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effectiveness</td>
<td># Applications</td>
<td>1 per site</td>
<td>1-2 daily</td>
</tr>
<tr>
<td>Specitivity</td>
<td>Local Delivery</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>#Hone to Infection Site</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Safety</td>
<td>Severity of Side Effects</td>
<td>Mild</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

This tooth shows decay (green) and an apical abscess (blue) where infection has spread through the canals of the tooth.

### Discussion

Current antibiotic treatment - when combined with SRP – only temporarily stop the problem but do not eliminate the root of the infection and therefore are not completely effective.

### Conclusion

Current antibiotic delivery systems are inadequate. To effectively and efficiently treat oral infections, a new delivery system needs to be developed. The new system needs to combine the pros of the systemic and local delivery systems to:

1. Treat bacteria deep in the pockets
2. Eliminate biofilm
3. Localize the antibiotic to the infection site