New OVDs: Does 2% Sodium Hyaluronate (Visiol™) have significant advantages over 1% Sodium Hyaluronate to justify its use in Routine Cataract Phacoemulsification?

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Introduction

• Sodium Hyaluronate 1% (Healon™) has been the “viscoelastic for routine cataract surgery”, in Warrington Hospital, since 1983. Recently a new product was introduced to the market: Sodium Hyaluronate 2% (Visiol™).

• We were asked if we would like to evaluate this new product to see if it had any clinical and cost saving advantages?
Composition of Healon™ & Visiol™

• Healon™ (0.4, 0.55, 0.85 ml)
• Sodium Hyaluronate 1% (Rooster Combs)
• Phosphate Buffer
• Abbott Medical Optics: Sweden

• Visiol™ (1.0 ml)
• Sodium Hyaluronate 2% (Fermentation)
• Phosphate Buffers
• Mannitol
• TRB Chemedica: Switzerland
Patients & Methods

• 100 patients listed for “routine cataract phacoemulsification” received Visiol™ in place of the current “routine viscoelastic” Healon™.

• 4 Consultants, 2 Staff Grades, 2 Trainees compared it with their previous experience of Healon by scoring:
  – Worse than Healon: 1
  – Same as Healon: 2
  – Better than Healon: 3
Scores:
– Worse than Healon: 1
– Same as Healon: 2
– Better than Healon: 3

Results:
1. “Stability of ac for capsulorrhesis”: Mean Score = 2.7
2. “Stability of ac for insertion of IOL”: Mean Score = 2.7
3. “Ease of aspiration” *: Mean Score = 2.0

* “taking into account that 2% sodium hyaluronate (Visiol) ‘fractures’ during removal and therefore takes longer to remove than Healon”.
4. **Volume**: Visiol (1ml) compared with Healon (0.85ml) an advantage?: 98/99 (99%)

5. **Residual Visiol** noted in ac at the end of phaco (‘possible endothelial protection’): 71/98 (72%).

6. **First Day Post-op**:
   - ac activity: ‘cells +/+++’.
   - Mean IOP: 14.7
   - 1 patient 26, 1 patient:36 others:8 – 22 mmHg
## Comparison of Different OVDs* Used in Warrington Hospital

<table>
<thead>
<tr>
<th>Product</th>
<th>Composition/Concentration</th>
<th>Source</th>
<th>MW (Da x 10^6)</th>
<th>Volume (mls)</th>
<th>Price (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMO: Healon</td>
<td>SH 1%</td>
<td>rooster comb</td>
<td>4</td>
<td>0.85</td>
<td>17.63</td>
</tr>
<tr>
<td>AMO: Healon GV</td>
<td>SH 1.4%</td>
<td>rooster comb</td>
<td>5</td>
<td>0.55</td>
<td>31.73</td>
</tr>
<tr>
<td>Alcon: Duovisc (Viscoat Provisc)</td>
<td>Viscoat = Chond Sul 4% + SH 3% + Provisc SH 1%</td>
<td>CS: 0.0225, SH: &gt;0.5 &gt;1.1</td>
<td>0.5</td>
<td>0.55</td>
<td>35.25</td>
</tr>
<tr>
<td>TRB: Visiol</td>
<td>SH 2%</td>
<td>fermentation</td>
<td>1.8</td>
<td>1</td>
<td>14.50</td>
</tr>
</tbody>
</table>

* Ophthalmic Viscosurgical Devices
Cost Saving

• Although Visiol™ is manufactured in Switzerland its price is related to the Euro and has recently risen.

• Current savings compared to Healon™ are £3.63 (US$5.53) per syringe.

• i.e. a potential saving of £7,260 (US$11,000) over 2,000 cases.
Other Clinical Advantages

? Free Radical Scavenging

• In addition to the apparent increased retention and possible mechanical endothelial protection, that 2% sodium hyaluronate would appear to have over 1% sodium hyaluronate, we noted the advantage of the presence of mannitol in Visiol.

• Hydroxyl and superoxide radicals can be released during phacoemulsification as a result of cavitation, posing an oxidative threat to the corneal endothelium.
Mannitol & Free Radical Scavenging

- Although Sodium hyaluronate has been shown to act as a free radical scavenger, this may not be sufficient to adequately protect the corneal endothelial cells.

- To enhance this effect, Visiol contains mannitol, a powerful anti-oxidant which is able to ‘mop up’ free radicals, and offer additional protection to the corneal endothelial cells, to that provided by 2% sodium hyaluronate alone.
Conclusion 1

• Visiol™ was well received by the participating surgeons who felt it had clinical and cost advantages over Healontm.

• Clinically they noticed:
  1. improved control of capsulorrhexis.
  2. improved ac stability.
  3. with no excessive post-op IOP elevation.
Conclusion 2

• I, and some of the other Warrington Surgeons, have already adopted 2% Sodium Hyaluronate (Visiol™) as our “routine viscoelastic” (OVD) since commencing this trial.

• We feel that 2% Sodium Hyaluronate (Visiol™) has sufficient advantages, over 1% Sodium Hyaluronate (Healon™), to justify it’s use in routine cataract phacoemulsification.
Conclusion 3

Comments from other participating surgeons:

“The more you use it, the more you like it” (Consultant)

“Behaves like ‘Viscoat™’” (Consultant)

“Does not escape out of the wound, as Healon does” (Staff Grade)

“Good experience overall, worked well enlarging pupil as patient was only mid-dilated” (SpR)
Thank You

The author has no financial interest in any of the products in this study.