Is it enough to use rumen magnet once a life to permanently prevent hardware disease in buffaloes?

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Introduction
Introduction

• Buffaloes are an important part of livestock agriculture in Asia since 5000 years, producing milk, meat, hides and draft power.

• Foreign body syndrome of bovine is still a matter of concern in different veterinary practices all over the world.

• Hardware disease is an alternative term for bovine traumatic reticuloperitonitis and sharp foreign body syndrome.
Introduction

Ingestion of a sharp object

Settlement in the reticulum

Irritation or penetration of the reticular wall

Several complications.
<table>
<thead>
<tr>
<th>Disorder</th>
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<tbody>
<tr>
<td>Traumatic Reticulitis</td>
</tr>
<tr>
<td>Traumatic Reticuloperitonitis (local and diffuse)</td>
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<tr>
<td>Reticular Abscess</td>
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<tr>
<td>Traumatic Pericarditis</td>
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<tr>
<td>Diaphragmatic Hernia</td>
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<tr>
<td>Vagal Indigestion</td>
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<tr>
<td>Hepatic Abscess</td>
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<tr>
<td>Splenic Abscess</td>
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<tr>
<td>Pleurisy and Mediastinal Abscess</td>
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<tr>
<td>Traumatic Pneumonia</td>
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<td>Rupture of left gastro-epiploic artery</td>
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</tbody>
</table>
Introduction

The incidence of the disease is high in all developing countries as Egypt, Iraq, and India.

Economic losses

- Sharp drop in milk yield
- Reduction in meat production

Economic losses

- Treatment costs
- Potential fatalities
- Fetal Losses
Reticular magnets has become a popular preventive routine for the hardware disease but there is no report concerning its efficacy as a long term preventive measure.
Aim of the study

Is it enough to use rumen magnet once a life to permanently prevent hardware disease in buffaloes?
Materials and Methods
Introduction

• Animals
  • 3100 buffaloes

• Time of the study:
  • 8 years

Iraq
Introduction

Group I

- 1200 buffaloes suffered from hardware disease.

Group I

- Rumenotomy was carried out for these buffaloes and rumen magnet was dropped into the reticulum.

Group I

- Follow up for seven years was done. Repeated rumenotomy was carried out in all buffaloes that had recurrent hardware disease
Group II

• 1900 healthy buffalo heifers given prophylactic ruminal magnets orally at the age of 6-9 months

Group II

• These animals were followed up for seven years for any complications and possible occurrence of hardware disease

Group II

• Rumenotomy was carried out in hardware diseased buffaloes
Statistical analysis:
Proportions of buffaloes which developed hardware disease during the first 4 years and at 5, 6 and 7 year after the use of magnet were compared using chi-square test in IBM SPSS (version 20) within and between group I and group II and all data were reported.
Results
In group I:

- The affected animals were 1195 females and 5 buffalo bulls of 2-9 years old.
- No complications were reported after dropping of magnets into the reticulum.
- Recurrent hardware disease was recorded in 110 animals representing 10.8% of the total examined buffaloes.
In group II:

- Regurgitation was recorded in 1.5% of the total examined heifers.

- Hardware disease was diagnosed in 155 animals representing 8.9% of the total examined animals.
• The incidence of developing a hardware disease during the first 4 years after the use of rumen magnet was 0% in both groups.

• Starting from 5th year, a time dependent increase in the proportion of buffaloes developing a hardware disease was noticed in both groups.
### Numbers of animals

<table>
<thead>
<tr>
<th></th>
<th>Group I</th>
<th>Group II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total examined buffaloes</td>
<td>1200</td>
<td>1900</td>
</tr>
<tr>
<td>Discarded buffaloes</td>
<td>185</td>
<td>154</td>
</tr>
<tr>
<td>Followed up buffaloes</td>
<td>1015</td>
<td>1746</td>
</tr>
<tr>
<td>Hardware diseased buffaloes during 1&lt;sup&gt;st&lt;/sup&gt; – 4&lt;sup&gt;th&lt;/sup&gt; year post magnet use</td>
<td>0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Hardware diseased buffaloes during 5&lt;sup&gt;th&lt;/sup&gt; year post magnet use</td>
<td>23 (2.3%)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>35 (2.0%)&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Hardware diseased buffaloes during 6&lt;sup&gt;th&lt;/sup&gt; year post magnet use</td>
<td>39 (3.8%)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>43 (2.5%)&lt;sup&gt;b*&lt;/sup&gt;</td>
</tr>
<tr>
<td>Hardware diseased buffaloes during 7&lt;sup&gt;th&lt;/sup&gt; year post magnet use</td>
<td>48 (4.7%)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>77 (4.4%)&lt;sup&gt;c*&lt;/sup&gt;</td>
</tr>
<tr>
<td>Total hardware diseased buffaloes</td>
<td>110 (10.8%)</td>
<td>155 (8.9%)</td>
</tr>
</tbody>
</table>

Different alphabets indicate significant difference within the same group at $P < 0.01$

* Asterisks denote a statistical difference between groups at $P < 0.05$
Introduction

Complete filling of cage magnets with foreign bodies. The magnetic power of the retrieved reticular magnets was similar to the new one.
• The trapped metallic foreign objects included wires, nails, needles, knives, keys, coins, screws, rings, can-openers and iron pieces of various sizes.

• In addition, other non-metallic foreign bodies as bones, feathers, gravels, stones, sand, pieces of rubber, glass and clothes, shoes, ropes and plastic bags were also removed during rumenotomy.
Introduction

Traumatic Reticulitis (n=608)

Local Traumatic Reticuloperitonitis (n=461)

Reticular Abscess (n=191)

Diffuse Traumatic Reticuloperitonitis (n=96)

Traumatic Pericarditis (n=68)

Diaphragmatic Hernia (n=32)

Splenic Abscess (n=9)
Conclusions
• Administration of the rumen magnets is an effective prophylaxis for hardware disease in buffaloes.

• It is not enough to use rumen magnet once a life to permanently prevent this disease in buffaloes at high risk.

• Reappplication of a new magnet is recommended four years later.
Thank You