PROS AND CONS FOR A MAGNET-BASED NAVIGATION DEVICE FOR SINUS AND ANTERIOR SKULL BASE SURGERY
LARIBOISIERE EXPERIENCE WITH DIGIPOINTEUR.

KANIA R, SAUVAGET E, BAYONNE E, EL BAKKOURI W, TRAN BA HUY P and HERMAN P,
Department of Oto-Rhino-Laryngology, Head & Neck Surgery, Lariboisiere Hospital, Paris VII University, Paris, France

ABSTRACT

Aim of the study: The use of navigation systems for sinus surgery is still a matter of controversy. Should it be advocated only for selected difficult cases, or considered as mandatory for any surgery? Moreover, most reports are based on infrared guided systems, and data on the contribution of magnet-based systems are scarce. This paper presents our experience with the DigiPointeur system. In this study, indications and surgical iatrogeny are evaluated.

Methods: Retrospective study concerning the use of a magnet-based navigation device in a tertiary care center. Evaluation of usefulness is based on operative reports, success rate of surgery, incidence of morbidity and surgeon's requirements.

Results: 220 cases have been treated since 2004 with the help of the DigiPointeur in our department. The accuracy of the system was excellent as far as the headed was left undisturbed during the procedure. Patients elected for navigation in the first year required revision endoscopic sinus surgery, transphenoidal tumor surgery, or endoscopic biopsy of skull base lesions. Since the use of the navigation system was left to the surgeon’s appreciation, a shift in the surgeon’s requirements was evidenced, and navigation was progressively used for all kind of FESS. During this period, no cerebrospinal fluid leaks, optic nerve lesions, retrobulbar haematomas or intracerebral bleeding were encountered. The system did never interfere with the presence of the surgeon and resident around the head of the patient.

Discussion: Apart from anterior skull base lesions and second hand sinus cases, which represent classical indications for navigation systems, the use of a magnetic navigation system brings a significant contribution to surgeon’s orientation as evidenced by the wider use of the device by senior surgeons. Furthermore, image-guided surgery proved to be of great help for teaching purposes.

Conclusions: Based on these data, the magnetic-based DigiPointeur navigation system seems useful for a large variety of endonasal procedures.

INTRODUCTION

The use of navigation systems for sinus surgery is still a matter of controversy. Whereas some recommend its use for selected difficult cases, others consider it mandatory for any type of endonasal surgery.

In our center, we present our experience with the DigiPointeur system which is a magnet-based system. In this study, evaluation of usefulness is based on operative reports, success rate of surgery, incidence of morbidity and surgeon’s requirements.

MATERIALS & METHODS

This retrospective study has been undertaken in a tertiary ENT and Skull Base Care Center. The evaluation of usefulness was done with the following main outcome measurements:

- Frequency of use
- Precision
- Surgeon’s satisfaction
- Surgical morbidity
- Usefulness according to type of surgery
- Usefulness: out of 35 cases since 2000, 19 treated endoscopically
- Usefulness: – Hemis extension
- Usefulness: – Molding of bone invasion

RESULTS

Frequency of use

<table>
<thead>
<tr>
<th>Year</th>
<th>FESS</th>
<th>Secondary Surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>2005</td>
<td>19</td>
<td>22</td>
</tr>
<tr>
<td>2006</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>2007</td>
<td>32</td>
<td>32</td>
</tr>
</tbody>
</table>

Usefulness according to type of surgery

- Tumors and Skull Base
- Secondary surgery
- TOTAL

CONCLUSION

Any image-guided surgery tool is not a replacement for the surgeon’s knowledge, expertise, or judgment. But indications for transnasal endoscopic approach are getting enlarged and require expertise, high quality devices and high quality imaging.