Nasosinusal Endoscopic Surgery as Major Out-Patient Surgery

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Introduction: Functional endoscopic sinus surgery (FESS) is a useful and widespread technique that allows the treatment of a large number of nasal pathologies. Nevertheless, although many ENT operations are carried out on an out-patient basis, FESS procedures commonly require at least 1 day of hospital admission in many centres.
Objectives: To evaluate our experience in FESS as day-case, to study causes of unexpected overnight admission, and to identify any risk factors for failing to comply with early discharge.
Material and method: We studied 145 patients consecutively subjected to out-patient FESS procedures for chronic rhinosinusitis, antrochoanal polyps, and dacryocystorhinostomy from August 2004 to June 2007. We analyzed sex, age, medical history (arterial hypertension, asthma, Widal syndrome), pathology, associated septoplasty, extent of the surgery, and revision surgery.
Results: The re-admission rate was 13.1% with the following as the most frequent causes: bleeding (31.6%), requiring only observation in over half the cases (ie, without changing the nasal packing), and dizziness/weakness (36.8%). Only revision surgery was associated with an increase in the re-admission rate (odds ratio, 3.5; 95% CI, 1.2-10.1).
Conclusions: Our experience in FESS for out-patient surgery shows a readmission rate of 13.1%, although most cases were related to minor complications. Revision surgery was the only variable that could be associated with an increase in re-admission rate.

Key words: FESS. Dacryocystorhinostomy. Day-case. Out-patient surgery. Re-admission rate.

Cirugía endoscópica nasosinusal como cirugía mayor ambulatoria

Introducción: La cirugía endoscópica nasosinusal (CENS) es una técnica quirúrgica muy extendida que permite el tratamiento de múltiples enfermedades del área nasosinusal. Por otro lado, aunque muchas intervenciones otorrinolaringológicas se realizan ambulatoriamente, la CENS todavía se aplica con al menos un día de ingreso en la mayoría de los hospitales.
Objetivos: Evaluar nuestra experiencia en CENS como cirugía mayor ambulatoria, analizar las causas que causaron el ingreso inesperado e identificar algún factor de riesgo para no cumplir con el alta precoz.
Material y método: Se estudia a 145 pacientes intervenidos ambulatoriamente mediante CENS por rinosinusitis crónica, pólipos antrocoanales y dacriocistorrinostomías desde agosto de 2004 a junio de 2007. Se analizaron las variables: sexo, edad, antecedentes personales (hipertensión arterial, asma, síndrome de Widal), enfermedad intervenida, septoplastia asociada, extensión de la cirugía y cirugía de revisión.
Resultados: El índice de sustitución fue del 13,1%; las causas más frecuentes fueron las hemorragias (31,6%), de las que más de la mitad sólo precisaron observación sin recambio de taponamiento, y mareo/debilidad tras cirugía (36,8%). De todas las variables estudiadas, sólo la cirugía de revisión se asoció a un incremento en la tasa de reingreso (odds ratio = 3,5; intervalo de confianza del 95%, 1,2-10,1).
Conclusiones: Nuestra experiencia en CENS como cirugía mayor ambulatoria muestra un índice de sustitución del 13,1%, si bien la mayoría de los casos correspondieron a pacientes con complicaciones leves. La cirugía de revisión supuso en nuestra serie un factor que aumentó la tasa de ingreso.

Palabras clave: Cirugía endocópica nasosinusal. Dacriocistorrinostomía. Cirugía mayor ambulatoria. Índice de sustitución.

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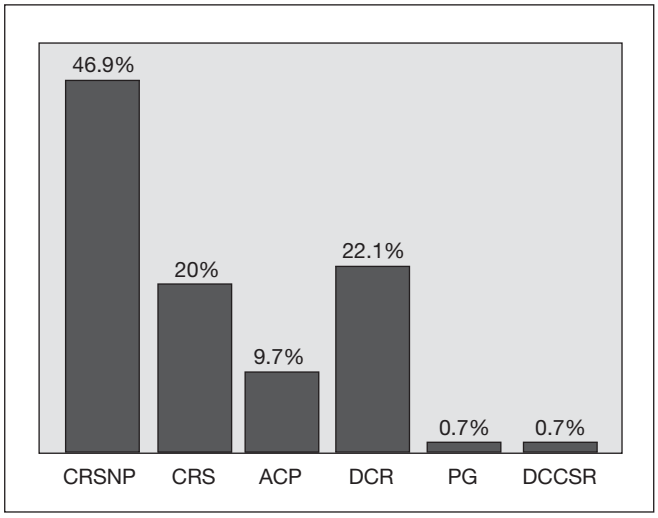

Figure. Distribution by diseases of nasosinusal endoscopic surgery scheduled as ma or out-patient surgery.
D R indicates dacryocystorhinostomy; D R , D R chronic rhinosinusitis; PG, pyogenic granuloma; A P, antrochoanal polyp; R , chronic rhinosinusitis; R P, R with nasal polyposis.

INTRODUCTION

Functional endoscopic sinus surgery (FESS) is a diagnostic and therapeutic technique commonly used by otorhinolaryngologists.[1] This surgical procedure, introduced in Spain toward the end of the last century,[2] is constantly evolving, even though its limits have still to be explored.[3] Technological advances and our greater and better knowledge of the complex anatomy of the sinuses have progressively led to this technique[4] being used the world over.

From another point of view, the need to reach a higher degree of hygienic efficiency has allowed this major out-patient surgery (MOS) to be seen as a surgical method that is more and more within our field of speciality.[5] Patients benefit by getting back to their normal lives very quickly, while surgical costs are reduced. There are currently many procedures that are performed as out-patient surgeries (adenoidectomy, transtympanic drainages, direct laryngoscopies, septoplasties, etc).[6] However, not all surgical techniques can be performed as MOS. They must not last long, they must have a low incidence of complications and oral painkillers must be an acceptable part of the treatment. Success is also due to a careful selection of those patients who are good candidates and who do not present important medical histories that increase the possibility of complications following surgery.

Can FESS be performed as MOS? We are dealing with relatively short surgical procedures, in middle-aged patients, most of whom do not have any important medical problems, and who could be easily handled from a pain-management point of view. Generally speaking it is a safe procedure,[7-9] with a low rate of complications. The most frequent complications, such as nasal bleeding, are usually resolved without having to take aggressive measures. However, although not frequently seen, we must always be aware of the possible appearance of serious complications,[10-12] such as a cerebrospinal liquid fistula, lesions of the extrinsic ocular muscles, or an affected optic nerve.

In Spain, most ENT departments currently perform this type of procedure, but there are still many that do it with at least 1 day[13] of scheduled hospital stay, which is the average in order to observe the patient to see if any adverse side-effects arise following surgery.

This paper presents our cases of FESS as MOS by studying our substitution index (patients who were programmed to undergo out-patient procedures but then had to be re-admitted due to complications or anaesthetic issues). We also compare the group of patients treated successfully by an out-patient procedure with that of patients who eventually had to be re-admitted to the hospital in search of some variable that will allow us to detect them in the future and not have them undergo MOS.

MATERIALS AND METHOD

A retrospective and descriptive study was done on therapeutic FESS procedures performed as MOS under general anaesthesia in our hospital between August 2004, and June 2007.

Both diagnosis and indication of FESS due to chronic rhinosinusitis without nasal polyposis (CRS) and with nasal polyposis (CRSNP) were performed according to the EPOS3 consensus document.[14] Pre-surgery treatment consisted of a topical steroid for all cases with CRS and CRSNP and short intermittent doses of oral steroids (with a maximum of 3 cycles per year) only for those cases of CRSNP. A lack of improvement or control of symptoms was the most important indication for performing the surgery. Generally speaking all surgical procedures treating this disease were performed under the functional surgery rule,[15] by opening the affected sinuses and keeping the healthy mucosa intact as far as possible. An ophthalmologist previously assessed patients re-admitted for dacryocystorhinostomies (DCR) to be surgically treated. In every case of FESS, the procedure concluded by plugging the nasal passages with an 8 cm-long Merocel® nasal tampon covered in latex (a glove finger) and soaked in saline solution.

After the procedure, those patients who underwent MOS were taken out of the operating room and into a recovery room for observation. They remained there between 2 and 4 hours until their vital signs and ability to walk were stable and they did not have nausea and/or vomiting, their pain was under control, and there were no signs of active bleeding. If everything went according to plan, then they left the recovery room and were sent into a waiting area. If the patients' oxygen saturation, blood pressure, respiratory frequency, level of consciousness, and motor skills were all normal, they were sent home.

A total of 171 FESS were indicated, with 145 being programmed as MOS (Figure), ie, 85% of the total number performed during that period. The reasons the other 15% were excluded were due to surgical issues (combined with open procedures such as Caldwell-Luc in 2 cases) or medical

ones (patients who were not fit for MOS because they did not meet the medical requirements during the preliminary anaesthetic consultation).

Of the group of 145 patients who underwent FESS as MOS, 2 groups were established (Table 1): group I was made up of patients programmed for FESS as MOS who were sent home the same day; group II included patients programmed for MOS who had to be kept under observation (substitution index). Different variables are analyzed and compared from both groups: age, gender, medical history, whether or not surgery was performed unilaterally or bilaterally, the extension of chronic rhinosinusitis (if present) with or without polyposis and antrochoanal polyps, associated septoplasty, or whether or not revision surgery was required.

In order to study the qualitative variables, contingency tables were used as well as the χ^2 analysis or Fisher's exact test. In order to study the quantitative and qualitative variables, Student *t* test was calculated after previously checking the homogeneity of variance. A *P* value less than .05 was considered significant.

RESULTS

Of the 145 FESS performed as outpatient surgery, 19 patients (13.1%) were re-admitted following surgery either from the recovery room or from the emergency room (group II): 3 cases of CRS (10.3%), 10 cases of CRSNP (14.7%), 2 cases of antrochoanal polyps (14.3%), 3 cases of DCR (9.4%), and only 1 case of DCR and chronic sinusitis. The reasons for patients being re-admitted are: 6 for bleeding (31.6%), of whom 4 (66.7%) were cases of light bleeding and only required observation; 1 (16.7%) needed the nasal plug to be adjusted and another one (16.7%) needed the nasal plug to be surgically replaced. Other causes for patients being re-admitted were dizziness, weakness, or prolonged lack of tolerance following surgery in 7 cases (36.8%). There was also periorbital haematoma in 2 cases (10.5%), allergic reaction to metamizol in 1 case (5.3%), and oedema of the uvula in another case. The last 2 cases (10.5%) suffered cerebrospinal fluid fistulae, both of which were detected and repaired during surgery. One patient was kept in for observation, with a good outcome, while the other had to be referred to the neurosurgery department due to pneumoencephalus.

Group I (the group of patients who had successful MOS) is made up of 126 patients whose average age was 44, with ages ranging from 16 to 75. Distribution by gender was 53.2% male and 46.8% female. Medical histories were divided into 5 categories in order to be analyzed (Table 2). The extent of surgery (which was only assessed in cases of CRS, CRSNP, and antrochoanal polyp) is shown in Table 3. Septoplasty was associated with the main procedure in 24.6% of the interventions; 14.3% were revision surgeries; and 46.8% were bilateral surgical interventions.

Group II (patients that were finally admitted after MOS) is made up of 19 patients whose average age is 45, with ages ranging from 22-74 years, with 57.9% males and 42.1% females. Medical histories are summarized in Table 3. The extent of surgery (which was only assessed in cases of CRS, CRSNP, and antrochoanal polyp) is shown in Table 3. Septoplasty was performed in 31.6% of the procedures. Revision surgery was performed in 36.8% of the cases. Treatment was bilateral for 57.9% of the patients.

Thus, in our series of 171 patients who needed FESS, 145 met all the requirements to be included on the surgical waiting list for MOS, and 126 of them were discharged early.

a e 1. Distribution by Diseases of asosinusal Endoscopic urgery by Groups[a]

	Group I	*Group II*
hronic rhinosinusitis with nasal polyposis	46%	52.60%
hronic rhinosinusitis	20.60%	15.80%
illian s polyp	9.50%	10.50%
Dacryocystorhinostomy	23%	15.80%
Pyogenic granuloma	0.80%	0%
Dacryocystorhinostomy and chronic rhinosinusitis	0%	5.30%

[a]Group I indicates patients programmed for E as MO who were sent home the same day. Group II, patients programmed for ma or out-patient surgery that had to be ept under observation.

a e 2. omparison of Medical Histories

	Group I	*Group II*
o medical history of interest	65.90%	68.40%
Arterial hypertension[a]	9.50%	10.50%
Asthma[a]	15.10%	15.80%
Arterial hypertension and asthm[a]	3.20%	0%
Other conditions[a]	6.30%	5.30%
A A triad[b]	20.70%	40%

[a]*P* .05.
[b] linically relevant effect without significant statistical difference (*P* .05).

a e 3. Procedure Means: the Mean umber of inuses Operated on, With or Without eptoplasty

	Group I	*Group II*	*P*[a]
Antrostomy	100%	100%	.054
Anterior ethmoidectomy	72.90%	80%	.054
Posterior ethmoidectomy	52.10%	40%	.054
rontal	19.80%	26.70%	.054
phenoids	15.60%	13.30%	.054
ilaterality	46.80%	57.90%	.054
eptoplasty[b]	24.60%	31.60%	.054
Revision surgery[c]	14.30%	36.80%	.0244

[a] evel of significance obtained in the contrast of hypotheses by comparing groups I and II.
[b] eptoplasty associated with the main procedure.
[c]Revision surgery due to relapse or persistence of the condition (odds ratio, 3.5; 95% confidence interval, 1.2-10.1; *P* .024).

a e 4. Procedure Average: the Average umber of inuses Operated on With or Without eptoplasty. Only R , R P, and Antrochoanal Polyp ases Were tudied

	o.	Mean[a]
Group I	96	4.8
Group II	15	5.1

[a]Difference of means, 0.3; 95% confidence interval, 1.3 to 1.8; *P* .72.

Comparing both groups we can see there is no significant difference (*P*>.05) in the variables of age, gender, significant medical history, which disease required surgery, whether or not the procedure was done unilaterally or bilaterally, or any associated septoplasty. In order to assess the role of the extension of the surgical procedure, each sinus was analyzed separately (Table 3) as was the possible link between the number of sinuses operated for each patient and associated septoplasty and their unexpected re-admission (Table 4). There were no statistically significant results in either case.

The only variable that showed a noteworthy effect (and that was statistically significant) was that of revision surgery. An odds ratio of 3.5 times above the unexpected re-admission was observed in revision surgery (95% confidence interval, 1.216-10.075; *P*=.024)

DISCUSSION

FESS is surgical procedure that is constantly evolving and that is being used practically all around the world. In spite of this, it is not exempt from possible serious complications that should not be left aside, which is why adequate preparation and correct peri-operative management are necessary. This is not incompatible with the use of FESS as a form of major out-patent surgery (MOS). This model, which is still scarcely used in Spain[13] and other countries such as the UK,[16] is used widely in other countries such as the United States[17] or Norway.[18] However, it does require a careful selection of those patients who are good candidates for the surgery as well as an adequate preliminary anaesthetic assessment to ensure the MOS will not only provide economic benefits but also that the patient will have a sense of improvement in his or her quality of life.

A number of surgical procedures have been performed as out-patient surgery for some time now. For years, there has been a trend toward incorporating new techniques into this format, even though not all of them allow the patient to go home early. Generally speaking, those that do not have a high rate of complications and do not require prolonged periods under anaesthesia are suitable. The patients also should not have a medical history of serious issues and meet a series of requirements in order to be sent home early. No complications should arise during the stay in the recovery room following surgery (bleeding, fever, loss of cognitive level, visual alterations), reach a good level of oral tolerance and pain control, the patient should reside close to the hospital, have someone with him for the first 24 hours, have a car and cell phone. In this way, any complications that may arise after the patient has been discharged may be handled very safely.[19]

In this paper we have shown that most of the patients (85%) who underwent FESS surgery following an anaesthetic assessment meet all the requirements for MOS. We must not forget that these are usually middle-aged patients that, except for cases of chronic rhinosinusitis that may be associated with asthma, do not present anything else important in their medical histories.[20] Analyzing our substitution index we arrive at 13.1%, which is somewhat high for this out-patient surgery. There are publications with lower indices (7.9%),[6] but they include procedures such as direct laryngoscopies and myringotomies, that have a much lower complication rate than FESS. However, in our series, studying the causes, we can see that most complications were light bleeding, weakness, and dizziness, which only warranted observation. We had 2 serious complications of cerebrospinal fluid fistulae that were detected during surgery (and the patients were kept in for observation) and 1 serious case of severe haemorrhaging (that required surgical endoscopic examination). Therefore, except for the last 3 cases, all the other patients were admitted for minor complications and mostly in order to maintain a high level of safety.

We think it is relevant that, even though there is no statistically significant difference, the percentage of patients from group II meeting the ASA triad requirements is double that of group I, which is a clinically relevant effect. In spite of this, there is a statistically significant difference with a higher prevalence of unexpected re-admission: those cases that need to be re-admitted because of persistence or recurrence of the disease.

To conclude: MOS is a beneficial surgical technique, both for the patient and for the clinic or hospital, which increases the quality of assistance. Both the condition (chronic rhinosinusitis and dacryocystitis, antrochoanal polyps) and the surgical procedure (FESS) generally meet the requirements necessary to be performed in an out-patient setting. Although there is always a risk of serious complications even if the patient meets the requirements for being sent home early, there is a very high level of safety. Therefore, and in line with current trends, FESS is an adequate procedure to be performed as out-patient surgery. However, in our series, the revision cases (either due to nasal polyposis recurrence, chronic sinusitis, or dacryocystitis) are linked to a higher number of unexpected re-admissions and therefore those patients may need to be turned down for MOS.

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