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Persistent epistaxis: what is the best practice?*

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SUMMARY

Epistaxis is the commonest otolaryngological emergency, which is often managed by a nasal pack. A significant number of cases fail to respond to nasal packing and various surgical measures are available to control the nosebleed in these cases. However evidence is sparse regarding the best available surgical option for the management of persistent epistaxis. We designed a retrospective cohort study comparing endoscopic ligation of sphenopalatine artery (ELSA) and all other surgical options (non-ELSA) in the management of persistent epistaxis. All consecutive cases of persistent epistaxis between 1997-2004 (Feb) requiring operative intervention were included in the study and divided in two groups according to the surgical intervention. Postoperative epistaxis was excluded. Non-ELSA group consisted of various procedures including nasal cautery and packing, submucous resection, anterior ethmoid artery ligation, external carotid artery ligation, internal maxillary artery ligation. Both groups were matched for age, sex, risk factors, other medical conditions and medications. The main outcome measures evaluated were immediate success in arresting the bleeding and the mean hospital stay. Recurrence and patient acceptability of the procedure were the secondary variables investigated. We found that ELSA proved to be the best practice to manage persistent epistaxis on all measures of immediate success rate, shorter hospital stay, recurrence rate, and patient satisfaction.

Key words: persistent epistaxis, endoscopic management, ligation of sphenopalatine artery

INTRODUCTION

Up to 15% of patients presenting with epistaxis may not respond to initial nasal packing and need some form of surgical intervention [1]. Various methods are available to control the bleeding in cases of persistent epistaxis [2]. They include repeat nasal packing with a range of different materials, postnasal pack (with Foley's catheter or different types of postnasal balloon), submucous resection, different types of nasal cautery and / or packing, internal maxillary artery clipping, anterior ethmoid artery ligation, external carotid ligation and selective arterial embolisation. However, significant morbidity has been reported with these procedures particularly due to nasal packing. Moreover failure rates up to 30% have been quoted [1]. Recently, endoscopic ligation of sphenopalatine artery (ELSA) has been advocated with promising results and minimal morbidity [3-5]. Although there are a few papers in the English literature reporting the results of ELSA [6-8], they are only case-series reports at best comparing historical control [9]. Neither direct comparative results between ELSA and other procedures nor RCT investigating the efficacy of ELSA were reported. It may be difficult designing a randomised trial as there seems to be no equipoise on its validity among the units that perform ELSA.

Aiming to improve the evidence level from the current level of IV to address this common issue we designed a retrospective cohort study comparing the results between ELSA and non-ELSA (amalgamation of various procedures including nasal cautery and packing, submucous resection, anterior ethmoid artery ligation, external carotid artery ligation, internal maxillary artery ligation) in the management of persistent epistaxis.

MATERIALS AND METHODS

The details of all consecutive cases of persistent epistaxis that required surgical intervention during 1997- 2004 were retrieved from the computer database. The case records were reviewed and data collected on age, sex, previous history of epistaxis and its management, any risk factors (i.e., warfarin intake), pre-existing medical conditions and medications, current management, success/ failure and complications. Group A consisted of all patients who underwent ELSA and group B consisted of patients who underwent any other operative procedures. They were matched for all other variables to minimise bias. Postoperative epistaxis after any routine nasal surgery was excluded from the study. All patients in the study groups were contacted by a telephone survey to find out about the 'patient satisfaction' on the surgical intervention he/she had, and any recurrence during the study period. The telephone questionnaire is shown in box 1. The response was entered in excel database for analysis. The practice of ELSA as followed in our unit is described in box 2.

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Box 1: Telephone questionnaire

1. Do you remember the incident of nosebleed, which resulted in an operation?
2. Did you have any further nosebleed after that operation?
3. If yes, did you go to hospital, and did you have another operation?
4. Finally can you tell me how would you rate your experience with the operation that you had for the nosebleed? *

* The following choice was offered: awful, alright, good, very good

Box 2: the technique of ELSA as we practised

The following equipment is essential for undertaking this procedure: zero degree Hopkins rod nasal endoscope, three-chip video camera and monitor.

A full general anaesthetic is undertaken with the appropriate precautions if the nose is actively bleeding or a full stomach is anticipated. Once the patient is on the operating table, the pack is removed from the nose and all blood clots are removed form the nasal cavity and the nasopharynx. Neurosurgical patties (soaked in 2 mls of 5% cocaine with adrenaline 1:100000) are then inserted into the nose on the side requiring operation. The lateral wall of the nasal cavity, including the uncinate process, bulla ethmoidalis and middle turbinate, is infiltrated with a total of 2 mls 1:80,000 adrenaline with 2% lignocaine. If active bleeding encountered then applying the patties to the bleeding point will reduce the bleeding and often bipolar diathermy can be very useful.

The uncinate process is identified but uncinectomy is never required. A small posterior middle meatal antrostomy is performed to allow identification of the posterior wall of the maxillary antrum, which allows the depth (how far posterior) of the sphenopalatine artery to be assessed. A muco-osteal flap is raised adjacent to the posterior end of the middle turbinate using the antrostomy as the anterior aspect of the flap. The sphenopalatine artery is identified as it exits from the foramen and the access is improved by gently elevating the muco-osteal flap off the artery. Failure to gain enough space would result in difficulties with applying the ligaclips.

Once satisfactory access is gained the ligaclips (Ethicon) are applied using a endonasal ligaclip applicator (supplied by Xomed from MicroFrance). Usually two clips are applied to the main arterial stem and a further clip applied to any branches that are evident. The flap is laid back on the lateral nasal wall and the operation is now completed. No packs are inserted into the nasal cavity.

Post-operatively steam inhalations are recommended at least three times per day with Vaseline applied to the nasal vestibules. Mobilisation is normally undertaken the following day depending upon the patient's general medical condition. And the patient is discharged home soon after.

Table 1. Study cohorts.

	Group A ELSA (n=41)	Group B Non-ELSA (n=37)
M:F	1.4:1	1.7:1
Mean age (range)	61 (22-92)	54 (28-83)
Warfarin	4	2
Aspirin	5	2
Hypertension	7	5
Previous nosebleed	14	12
R side	21	18
L side	18	15
Bilateral	2	4

Table 2. Non-ELSA procedures (n=37).

Procedure	Number	Postoperative packing	Failure
SMR	15	13	4
Nasal cautery (diathermy)	13	4	4
External carotid ligation (ECL)	2	1	1
Anterior ethmoid ligation (AEL)	2	1	1
ECL + AEL	5	4	1
Internal maxillary ligation	0	0	
Selective arterial embolisation	0	0	
Total	37	23 (62.1%)	11 (29.7%)

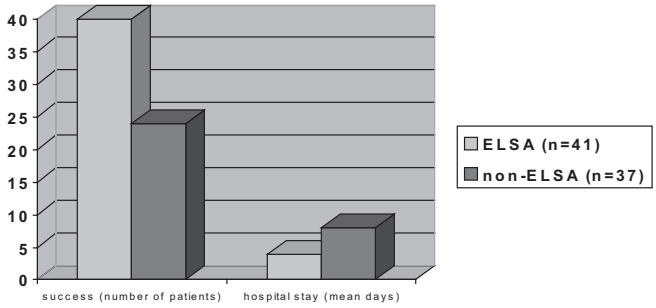

Figure 1. Outcome.

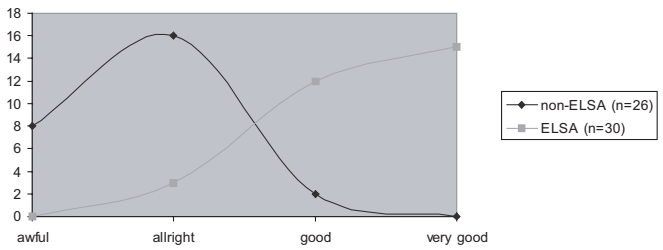

Figure 2. Telephone survey (response rate 72%).

RESULTS

Table 1 shows the characteristics of the study groups. Table 2 shows the details of the procedures amalgamated as non-ELSA. Primary outcome measures (successful control of epistaxis and duration of hospital stay) and telephone survey results are shown in Figures 1 and 2 respectively. All patients in the study had general anaesthesia for the procedure. None of the patients in ELSA group had postoperative nasal pack.

In group A the sphenopalatine (SP) artery was ligated successfully in all cases, which compares favourably with other series [4,7]. However, nosebleed recurred in one case after a few hours due to bleeding from the contralateral nasal cavity, which was successfully managed by performing ELSA on that side as well. In group B, 11 patients (29%) required a further procedure before discharged from the hospital. In some cases anterior and posterior packing was carried out and in some cases external arterial ligation of one or more arteries was performed and ELSA was performed in one case.

The recurrence rate of 1% was found with a mean follow up period of 43 months in ELSA group. This was slightly higher at 3% in non-ELSA group.

DISCUSSION

Table 1 shows that the study cohorts were fairly matched for other factors. Table 2 shows a range of non-ELSA procedures which are practised widely across the country. The quoted rate for immediate failure rate for ELSA is around 3-8% [4,7] and for non-ELSA procedures this figure could be up to 50% [1]. In our study this was respectively 1% and 29%. It was noted that the majority of the patients in group B (62%, Table 2) were left with postoperative nasal packs, which could partly explain the bitter feeling expressed by many patients at the telephone survey. The other notable feature was the absence of packing in 10 out of 13 cases of diathermy cautery of bleeding points. This shows that the operator confidence improves with direct visualisation of the bleeding point aiding its precise control and consequently the operation is finished with no need for 'blind' nasal packing. In this regard, it may also be noted that even tying both internal and external carotid arteries is not 'good' enough to leave the nose unpacked. This again shows that any indirect or blind attempts at controlling the epistaxis is almost always supported with the additional 'security' of nasal packing which leads to increased morbidity on its own [10].

We recognise our telephone questionnaire was not a validated one. It was thought that the structured telephone interview was rather difficult considering the age group of patients that we were dealing. The alternate of validated postal questionnaire was also thought to result in poor response rate. The telephone survey was conducted by junior authors with no hint of leading answer for question number 4 which was the main question of the survey. Although a choice was given to the patients we also recorded the responses in their own wordings. During our telephone survey most of the patients in ELSA group described the procedure to be 'good' (desirable, pleased, fine) or 'very good' (most desirable, very pleased, extremely happy) in contrast to non-ELSA procedures which were described 'all right' (neutral opinion) or 'awful'. Patient acceptability seems to be significantly higher for ELSA. We achieved a 72% response rate by follow up telephone calls if necessary.

The Anatomical basis of ELSA lies in the fact that the sphenopalatine artery is the most terminal artery supplying the nasal cavity [11]. Therefore its ligation proffers not only immediate control of epistaxis but also minimises the potential for the development of collateral vessels thereby avoiding failure or recurrence. Technically speaking mobilisation of the SP artery and application of ligaclips in ELSA utilises the surgical skills acquired at endoscopic sinus surgery. Therefore, the learning curve could be steep for those who already posses skills in endoscopic sinus surgery. All other surgical procedures that are amalgamated as non-ELSA group have been practised in the management of persistent epistaxis across the world with varying degree of success and morbidity [1,12]. However, except arterial ligation and embolisation they have little surgical basis in controlling the bleeding. In a significant proportion of cases, submucous resection (SMR) and nasal repacking have been performed with little evidence regarding its efficacy. When the nasal packs are left in situ for longer duration (more than 48 hours), this may result in significant morbidity on its own adding to the morbidity of epistaxis [1,2].

Ligation of sphenopalatine artery for epistaxis through the transantral approach was described in English literature in the early eighties [13]. The advent of endoscopic surgery and the consistent efforts at designing better technique to control epistaxis has culminated in ELSA, which was first described in early nineties [14]. Although widely recognised as an effective procedure the evidence level is only 4 (observational/ descriptive studies). It may not be feasible to obtain the approval of ethics committee for conducting a randomised trial. Therefore we attempted to exploit the experience of parallel practice in our unit in managing persistent epistaxis. Two practising surgeons were following ELSA as 'preferred'method in our unit since 1997. However, other methods (Table 2) were also in practice at the same time, primarily due to non-availability of the surgeons who could perform ELSA. Which of these procedures was performed in a given case depended on individual patient factors and the available surgeons experience and choice. This enabled us to match the groups as closely as possible for other variables that could influence the primary outcome. However, we recognise that the bias of introducing more variables than desired could not have been fully rectified due to the retrospective nature of our study. Despite this limitation the results showed significant difference between the groups on all four outcome measures. Perhaps this is one step forward in producing the desired evidence level.

CONCLUSION

ELSA proves as the best practice to manage persistent epis-

taxis based on the following variables of higher success rate, shorter hospital stay, and higher patient satisfaction.

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