

## Research Article

# Cost and Outcomes in Inpatient Management of Epistaxis

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## Abstract

**Objectives:** To review the cost and outcomes of conservative and surgical treatment of epistaxis in the mean length of hospital stay, mean total hospital charges to patient and estimated mean total hospital expenses for patient in Malaysian government healthcare system setting, another perspective as previously published studies were predominantly from the western countries.

**Study design:** Retrospective study.

**Methods:** The records of 65 patients admitted with a diagnosis of epistaxis (ICD-10 diagnosis code R04.0) to University Malaya Medical Centre (UMMC), a tertiary government medical centre in Malaysia from January 2002 to December 2005 were reviewed. All patients were evaluated for age, sex, race (according to national identity card), clinical presentation of epistaxis, possible causes of epistaxis, treatment, length of hospital stay, total hospital charges to patient and estimated total hospital expenses for patient.

**Results:** Four (6.2%) out of 65 patients failed conservative management and proceeded with endoscopic coagulation of sphenopalatine artery to stop the bleeding meanwhile 61 (93.8%) patients were successfully treated conservatively. The surgically treated group had an average length of hospitalization of 5.5 days whereas the conservatively treated group stayed an average of 3.8 days. Both of the differences of mean total hospital charges and estimated mean total hospital expenses for conservatively treated patients with the surgically treated group were statistically significant by Student's t-test with the p value <0.05.

**Conclusion:** Mean total hospital stay, mean total hospital charges to patient and estimated mean total hospital expenses for patient were lower for patients who were managed conservatively.

## INTRODUCTION

Epistaxis is a common emergency in ENT. It is defined as active bleeding from the nose. It remains a common problem treated by otorhinolaryngologists. It is estimated approximately 60% in the population at one time or another in their lifetime will suffer from varying degrees of epistaxis. Fortunately, only six percents of these people will require medical treatment to control and stop hemorrhage [1,2]. Control of bleeding, minimizing the length of hospitalization and low complication rates are the goals of all methods of therapy. Treatment modalities can be categorized as conservative and surgical intervention. Conservative treatment includes admission for observation with bed rest, anterior and posterior nasal packing. Surgical treatment includes arterial ligation, embolisation, electrocautery, cryotherapy, septoplasty and endoscopic guided control of bleeding.

Most published studies are from western countries based, it might be worthwhile to have another perspective from an

Asian country with a different healthcare system. The goal of this retrospective study is to review the cost and outcomes of conservative and surgical treatment of epistaxis mainly in the mean length of hospital stay, mean total hospital charges to patient and estimated mean total hospital expenses for patient in University Malaya Medical Centre (UMMC), a tertiary government medical centre in Malaysia from January 2002 to December 2005. Previous studies have indicated that early surgical intervention may result in either shorter or longer hospital stays than conservative treatment modalities. However, the cost of treatment is varied in different countries due to the diverse health care system and funding.

## MATERIALS AND METHODS

The records of all patients admitted with a diagnosis of epistaxis (ICD-10 diagnosis code R04.0) to University Malaya Medical Centre (UMMC) from January 2002 to December 2005 were reviewed. 65 patients were admitted within this period.

Treatment modalities provided were divided into conservative and surgical treatment. Conservative treatment consisted of admission for observation with bed rest, anterior nasal packing with BIPP (Bismuth Iodine Paraffin Paste) and posterior packing with Foley catheter. Surgical therapy consisted of endoscopy coagulation of sphenopalatine artery in patients who did not respond to conservative management for 48 hours. All patients were evaluated for age, sex, race (according to national identity card), clinical presentation of epistaxis, possible causes of epistaxis, treatment, length of hospital stay, total hospital charges to patient and estimated total hospital expenses for patient (Table 1).

The total hospital charges included hospital stay charges, meals, medications given, investigations and treatment given either conservatively or surgically. The daily hospital stay charge which included meal, ward procedures is RM 80 (based on UMMC charges schedule) which covered nearly half of the total hospital charges. Hospital subsidizes nearly three times the total amount of hospital charges to patient. The estimated total hospital expenses for patient (exclude healthcare providers' fees) is calculated based of the charges schedule in private wing UMSC where the patient pays all the hospital expenses without subsidized (Table 3).

Mean length of hospital stay, mean total hospital charges to patient and estimated mean total hospital expenses for patient treated conservatively or surgically were analyzed by student's t-test of significance with Statistical Package for the Social Sciences software (SPSS) version 12.0.

We also compared the mean total hospital charges to patients treated conservatively with estimated mean total hospital charges to patients treated surgically assumed if surgical intervention as first line treatment since admission (hospital charges calculated from the day that the surgical intervention given). The difference

	No. (%)
Number of patients	65
Male/Female	51 (78.5)/14 (21.5)
Mean age (year)	49.5 (range 14-92)
Median age (year)	45
Race (Malay/Chinese/Indian/others)	21/23/17/4
Side of bleeding (right/left/bilateral)	30 (46.2)/13 (20)/22 (33.8)
Possible causes	
Idiopathic	24 (36.9)
Malignancies	8 (12.3)
Trauma	3 (4.6)
Medical	15 (23.1)
(12/15 (80%) due to hypertension)	
Primary non malignant nose lesions	9 (13.8)
Post nasal surgery	6 (9.2)
Treatment	
Nonsurgical	61 (93.8)
Observe	4 (6.6)
Anterior packing	41 (67.2)
Anterior-posterior packing	16 (26.2)
Surgical	4 (6.2)

	Nonsurgical (No)	Surgical (No)
Number of patients	61	4
Male/Female	48/13	3/1
Mean age (year)	46.5 (range 14-92)	49.5(range 41-72)

	Epistaxis (n=65)	Nonsurgical (n=61)	Surgical (n=4)
Mean length of stay (day)	3.9	3.8	5.5
Mean total hospital charges to patient (Ringgit Malaysia RM/USD)			
	359.9/94.7	335.5/88.3	731.5/192.5
Estimated mean total hospital expenses for patient (exclude healthcare providers' fees) (RM/USD)			
	1202/316	1140/300	2150/614

Item	Estimated Amount (RM/USD)
Bed include meals, medications	160/42
<i>(All the 4 surgical treated patients discharged 2 days after post surgical intervention)</i>	
Surgical intervention	150/40
Investigations (blood, Radiology) and others	100/26
Total	410/108

Item	Estimated Amount (RM/USD)
Stay, meals, medications, investigations	600/158
<i>(All the 4 surgical treated patients discharged 2 days after post surgical intervention)</i>	
Surgical intervention	500/132
Total	1100/290

was analysed by the student's t-test of significance of SPSS software.

## RESULTS

All the patients were treated conservatively during initial period of admission for at least 48 hours. 4 (6.2%) out of 65 patients failed conservative management and proceeded with endoscopic coagulation of sphenopalatine artery to stop the bleeding meanwhile 61 (93.8%) patients were successfully treated conservatively. The 4 patients who failed conservative management were one essential hypertension, one post transsphenoidal hypophysectomy and two idiopathic. For the patient treated conservatively, 67.2% were managed with anterior packing, 26.2% were managed with anterior-posterior packing and 6.6% managed with admission and bed rest without

any nasal packing.

The surgically treated group had an average length of hospitalization of 5.5 days whereas the conservatively treated group stayed an average of 3.8 days. This was due to surgical interventions were performed after failure of conservative management for 48 hours. However, this was statistically insignificant by Student's t-test with p value of 0.295 (Table 3).

The mean total hospital charges to patient were RM335.50/USD88.3 for conservatively treated patients whereas the surgically treated group was RM731.50/USD192.5. The difference was statistically significant by Student's t-test with a p value of 0.001. In our centre setting as a tertiary referral centre, healthcare providers' salaries are fixed and not influenced by the type of surgery performed. The objective of this study is to compare the cost between surgical and conservatively group, therefore, healthcare provider's salaries are not included (Table 3).

The estimated mean total hospital expenses for patients were RM1140/USD300 for conservatively treated group whereby the surgically treated group was RM 2150/USD614. The difference was statistically significant by Student's t-test with a p value <0.05 (Table 3).

Estimated mean total hospital charges to patients and expenses for patients (exclude health providers' fees) assumed if surgical intervention as first line treatment since admission were RM410/USD108 and RM1100/USD290. (Table 4 and 5) The differences between mean total hospital charges and expenses for conservatively treated patients and estimated mean total hospital charges and expenses if surgical intervention as first line treatment since admission was analyzed by Student's t-test. The finding were not significant statistically with both p value>0.05.

## DISCUSSION

This study showed that patients hospitalized for epistaxis tended to be persons in their mid-forties to mid sixties. Men were affected more often than women [3-6]. In this study, the most common possible causes of epistaxis was idiopathic (36.9%) [7], followed by medical causes (23.1%) which 80% was due to uncontrolled hypertension. The possible causes were comparable with the study done by Wang<sup>8</sup> which idiopathic and hypertension were among the most common possible etiologic factors caused epistaxis.

Previous studies had indicated that early surgical intervention in epistaxis can result in either decreased or increased the length of hospital stay as compared to conservatively treatment. McDonald [9] and Wang [8] revealed shorter hospital stay with early surgical intervention. On the other hand, Schaitkin [4], Monux [10] and Shaw [3] revealed longer hospital stay for patients with epistaxis who were managed surgically. The aim of this study was to compare the length of hospital stay and the costs for those patients with epistaxis treated surgically and conservatively in an Asian setting with different healthcare system and compare our results with those of other institutions. The results of this study seemed to compare favorably for the conservatively treated group with 3.8 days length of stay compared with 5.5 days length of stay in surgically treated group. However, the difference was

not statistically significant. In our centre, the patients who were admitted for epistaxis were managed conservatively initially and surgical management only carried out after conservative management had failed. Most of the surgical interventions only intervened at least after 2-3 days followed failing conservative management. Therefore, patients who were managed surgically had longer stay in the hospital. Also, none of our conservatively treated patients rebled after 3 days during the same admission, leading us to believe that if a patient continued to bleed despite adequate conservative treatment after 3 days that patient might benefit by surgical intervention.

Comparison of mean total hospital charges to patients between conservative and surgical group showed statistically significant findings. Conservatively treated group had lower mean total hospital charges [11]. The total hospital charges included hospital stay charges, meals, medications given, investigations and treatment given either conservative or surgical. The daily hospital stay charge was RM 80 which covered nearly half of the total hospital charges. As we knew, all the patients who were managed surgically only after they had failed conservative management. All of them were proceeded for endoscopic coagulation of sphenopalatine artery after 2 to 3 days failing conservative management. The operative fees only consisted of ¼ of the total hospital charges. Therefore, it was not surprising, the total hospital charges to patients who were managed surgically were be higher.

Assumed if a patient admitted with epistaxis and surgical intervention was the first line treatment in our hospital setting, the total hospital charges would be estimated nearly the same as conservatively treated group in our hospital setting and the difference was statistically insignificant (Table 4). This can be explained as all the 4 surgical treated patients discharged from the hospital 2 days after post surgical intervention. With this fact, shorter hospital stay reduced the daily stay charge which covered nearly half of the total hospital charges. However, further study plan needs to be carried out to identify it.

As we know, Malaysian health care system divides into government and private setting. For government setting, the admitted Malaysian nationality patients' hospital expenses nearly 90% subsidized by government and the patients usually pay less than 10% of the total amount of hospital expenses whereas in private setting, the patients need to pay for the all the expenses. Therefore, most of the Malaysians will seek treatments from government hospital. The estimated mean total hospital expenses for patients treated conservatively was nearly half the expenses of patients treated surgically and the difference was statistically significant too. As 93.8% of epistaxis patients can be successfully managed conservatively with the same outcome in term of treatment as surgically managed group in this retrospective study, this would have saved large amount of government health care system financial resources and redirected into other better and need healthcare plans like rural health care system. Meantime, the operating theatre which supposed to use for the surgical intervention could be rescheduled for other more urgent or need cases.

On the other hand, most of the patients admitted for epistaxis in our hospital not keen for surgical intervention after

understanding the risks and possible complications for surgical intervention as well as most of the epistaxis cases could be managed successfully with conservative management.

## CONCLUSION

In conclusion, conservative management of epistaxis is associated with the shorter hospital stay, lower mean total hospital charges to patients and lower estimated mean total hospital expenses for patients from this study in Malaysia government healthcare system. However, surgical intervention is warranted in those patients who continued to bleed after adequate conservative management and as first line treatment for intractable epistaxis.

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