Transnasal Sphenopalatine Artery Electrocautery for Posterior Epistaxis

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Key Words
- electrocautery
- epistaxis
- sphenopalatine artery

Background. To evaluate the effects of sphenopalatine artery electrocautery for the treatment of recurrent posterior epistaxis.

Methods. Nine patients were enrolled in the study. Seven patients had hypertension, two had diabetes, two received irradiation for nasopharyngeal carcinoma, one had congestive heart failure and one was a heavy drinker. Three patients needed blood transfusion for profound blood loss. The sphenopalatine artery electrocautery was performed transnasally with endoscope. After the sphenopalatine foramen was identified, the neurovascular bundle in the sphenopalatine foramen was characterized.

Results. Most operations can be performed within fifty minutes with minimal blood loss under local anesthesia. One patient developed minor epistaxis 2 months after surgery, and the bleeding was controlled with medical treatment. The other patients had no recurrent epistaxis after surgery. Thus, epistaxis was well controlled in all patients with outpatient follow-up. The follow-up duration was 2 to 14 months after surgery, with a mean duration of 10 months.

Conclusions. Transnasal sphenopalatine artery electrocautery is a simple, effective and safe method for the treatment of posterior epistaxis.

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by Prade in the 1970s. Sulsenti et al in 1987 used Prade’s bivalved speculum and operating microscope to ligate the sphenopalatine artery in the middle meatus. Budrovich and Saetti in 1992 were the first to report the endoscopic intranasal ligation of the sphenopalatine artery. The introduction of the endoscopic intranasal surgery greatly facilitates the identification of SPA transnasally.

The method to interrupt the SPA blood flow includes ligation and cautery. Endoscopic intranasal ligation of SPA is effective for the control of epistaxis without significant complications. However, there is no report on the efficacy of SPA electrocautery for posterior epistaxis control. In this study, we report our experience of transnasal endoscopic SPA electrocautery in stead of ligation to treat patients with recurrent posterior epistaxis, and clarify its effects as well as safety.

**Methods**

Nine cases including 7 males and 2 females with recurrent posterior epistaxis were enrolled in this study. They were aged from 38 to 85 years, with a mean age of 62 years (Table 1). The patients were admitted for SPA cautery after nasal packing failed to control the bleeding. Three patients needed blood transfusion for severe blood loss. There were seven patients with hypertension, two with diabetes mellitus, one with congestive heart failure, and one heavy drinker. Two had received radiotherapy for nasopharyngeal carcinoma (Table 2). No patient had ever had any medication interfering with the coagulation function in the last month before epistaxis. The medical problems of hypertension, DM and congestive heart failure were controlled during hospitalization.

The operation was performed under local or general anesthesia. By using an endoscope, partial turbinectomy was performed on the posterior part of the middle turbinate, after which a vertical incision in the middle meatus was made 1 cm anterior to the choana (Fig. 1). A mucoperiosteal flap was elevated with a freer, and dissected posteriorly. The sphenopalatine foramen and the neurovascular bundle in it were identified (Fig. 2), together with the main trunk and

| Table 1. Related profile of enrolled patients with SPA electrocautery for epistaxis |
|---------------------------------|---------|---------|
| Age of patients (y/o) | 62 (85-38) | 13.2 |
| Operation time (minutes) | 54 (90-35) | 14.2 |
| Blood loss in operation (ml) | 38 (50-30) | 7.7 |
| Hospitalization duration (days) | 13 (41-5) | 10.3 |
| Follow-up (months) | 10 (14-2) | 3.5 |

| Table 2. Predisposing factors of epistaxis |
|---------------------------------|---------|
| Factors | No. (%) |
| Hypertension | 7 (77.8) |
| DM | 2 (22.2) |
| Irradiation | 2 (22.2) |
| Congestive heart failure | 1 (11.1) |
| Heavy drinker | 1 (11.1) |

DM = diabetes mellitus.

![Fig. 1. Vertical incision of the lateral wall of middle meatus, 1 cm anterior to posterior choana. (C: Posterior choana; LW: Lateral wall of middle meatus; MT: Middle turbinate).]()}
branches of the sphenopalatine art ery (Fig. 3). A suc tion com bined with uni po lar electrocauterizer tip was then applied over the main trunk, par tic u larly the nar row est point, to electrocauterize the SPA (Fig. 4) to lower the risk of bleed ing af ter electrocauterization due to the re main ing branch or in com plete cau ter i za tion of the ves sel. The power used was 3-5 Watts. The mucoperiosteal flap was replaced, and Merocel® pledget was packed in the mid dle meatus. The pack ing was re moved two days af ter sur gery.

Results

The av er age op er a tion time was 54 min utes with a mean blood loss of 38 c.c.. In this series, no intraoperative or postoperative complications, including intracranial or intraorbital, were noted. No other pro ce dure, such as li ga tion of the ves sels, was per formed. The mean hos pit al stay was 13 days (Ta ble 1). One of the nine pa tients with con ges tive heart fail ure ex pe ri enced a mi nor re cur rent epistaxis two months af ter the sur gery. The epistaxis was con trolled, how ever, by con ser va tive treat ment. The re main ing 8 pa tients had no re cur rence of epistaxis after sur gery. Thus, all the pa tients that had epistaxis were con trolled after sur gery. The follow-up period ranged from 2 to 14 months with an av er age of 10 months. The pa tients’ wounds healed well and no com pli ca tion was noted.

Discussion

The man age ments of pos te rior epistaxis are clas si fied into two groups: con ser va tive hemostasis and in va sive ves sel block age. The for mer in cludes na sal pack ing, ballon com pres sion, en do scopic cau ter i za tion, and in jec tion of greater pal a tine fora men. For mi-
nor oozing or iden ti fi able bleed ing point, en do scopic cau ter iz ation or vaso con stric ter injec tion can be suc cess ful. For ma sive pos ter ior epistaxis, na sal pack ing and bal lon com pres sion are nec es sary. How ever, na sal ob struc tion and dis com for t ca used by na sal pack ing may re duce the oxy gen satu ra tion of cir cu la tion, de ter i o rate the un der ly ing car dio vas cu lar or lung prob lems, and pos si bly cause death, es pe cially in de bili tated el derly pa tients.9 Long-term or fre quent na sal pack ings are not ade quate for this el derly group. If bleed ing con tin ues, the in va sive ves sel block age is con si dered. Vessel block age in cludes sur gery or an gi ographic em bol iza tion. Per cut ane ous em bol iza tion is an ef fec tive treat ment for pos ter ior epistaxis. How ever, it is not avail able in ev ery hos pi tal. In ad di tion, the pos si ble se vere com pli ca tion of em bol iza tion, es pe cially cerebrovascu lar dis ease, low ers the ac cep tabil ity of this modali ty by pa tients and their fam i lies.3,10

The pos si ble tar get ves ses of sur gical in ter ru p tion for pos ter ior epistaxis are ex trern al car otid ar tery, an ter ior ethmoid ar tery, pos ter ior ethmoid ar tery, IMA and SPA. The tra di tional ar ter ial li ga tion may cause sig nif i cant mor bid ity. The cer vi cal dis sec tion to ap proach the ex ter nal car otid ar tery may dam age the hypoglos sal and vag us nerve. The li ga tion of ethmoid ar ter ies may in duce op tic nerve or bital dam age.

Be fore in tra nas al en do scopic sur gery be came pop u lar, li ga tion or em bol iza tion of IMA was the main in va sive treat ment for se vere epistaxis. SPA is closer to the na sal bleed ing points than IMA and pre cludes a more im me di ate col lar eral cir cu la tion. The block age of SPA can de lay the re sump tion of col lar eral cir cu la tion lon ger (3–4 days) than the dis tal IMA li ga tion can (2 days)11 so that the mu cosa and tis sue may have more time to re cover. The well healed na sal mu cosa and tis sue pro vide a stron ger bar rier for frag ile ves ses to avoid re cur rent epistaxis. For IMA li ga tion, ap proach into ptery go ma xil lary fossa or dis sec tion, iden ti fi ca tion and clip ping the dis tal branch of IMA with special clip is tech nically diffi cult and needs soph isti cated ex pe ri ence of re lated anat omy and sur gical tech niques. In most cases, fail ure of IMA li ga tion to con trol epistaxis is at trib ut able to in abil ity to iden ti fy ves ses in the ptery go ma xil lary fossa or loos ened clip.12 There fore, the block age of SPA blood flow is more ef fec tive to con trol epistaxis than that of IMA.

The ap proaches to SPA are diverse, in clud ing trans an tral, trans se ptal and trans nas al meth ods. With the help of an en do scope, the trans nas al ap proach is eas ier to lo cate the sphenopalatine foramen and ar tery. Most of our op er a tions, in clud ing the iden ti fi ca tion and cau ter i za tion of SPA, ended within one hour. The trans an tral ap proach has more trou ble some com pli ca tions, such as facial num bness and pos sible den tal damage. The trans se ptal ap proach needs a longer route to reach the sphenopalatine foramen, and is not suit able for pa tients who have re ceived sub mu cosal re sec tion of the na sal se ptum. The trans nas al ap proach is rel atively eas ier and is less de struc tive to reach SPA.

The man age ment of SPA com prises li ga tion and cau tery. The li ga tion needs a spe cial in stru ment and a spe cial metal clip, which means ex tra cost for the pa tient or in sur ance agency. The metal clip in side is a con tra in di ca tion for possible MRI in the fu ture. In con trast to li ga tion, elect rocau ter i za tion needs only a suc cess ful clip ping of SPA as the first supplemen tary resolu tion, or trans nas al SPA or IMA li ga tion as the sec ond al ter na tive. The au thors would take en do scopic trans nas al clip ping of SPA as the first supple men tary resolu tion, or trans nas al SPA or IMA li ga tion as the sec ond al ter na tive. Elec tric shock to adja cent nerve may be an other con tra in di ca tion for pos si ble MRI in the fu ture. In con trast to li ga tion, elect rocau ter i za tion needs only a suc cess ful clip ping of SPA as the first supplemen tary resolu tion, or trans nas al SPA or IMA li ga tion as the sec ond al ter na tive. The au thors would take en do scopic trans nas al clip ping of SPA as the first supple men tary resolu tion, or trans nas al SPA or IMA li ga tion as the sec ond al ter na tive. Elec tric shock to ad ja cent nerve may be an other prob lem, but no pa tient com plained about re lated dis com for t post oper atively in our se ries.

In our se ries, SPA block age could be achieved sim ply by elect rocau ter i za tion with out fail ure or SPA rupture and fur ther bleed ing. How ever, an in com pre hensive cau ter i za tion of SPA may some times oc cur, fol lowed by ves sel rup ture and bleed ing. In that case, the au thors would take en do scopic trans nas al clip ping of SPA as the sec ond al ter na tive. Elec tric shock to ad ja cent nerve may be an other prob lem, but no pa tient com plained about re lated dis com for t post oper atively in our se ries.

Since the in tra nas al en do scopic SPA elect rocau tery is an ef fec tive and sim ple treat ment of pos ter ior epistaxis with min i mal op er a tive bleed ing and short hos pi tal iza tion,14 we ad vo cate per for ma nce of SPA
electrocauterization as early as possible for recurrent posterior epistaxis.

On the other hand, recurrent posterior epistaxis usually attacks aged people with many underlying medical problems predisposing to epistaxis, including (Table 2) hypertension, DM, irradiation and abnormal liver function caused by heavy drinking. Hypertension is not coincident with epistaxis, but it aggravates the severity of epistaxis. The correction of reversible underlying medical problems should be a prerequisite for the treatment of epistaxis.

In conclusion, the transnasal SPA electrocautery is a simple and cost-effective operative procedure for experienced otolaryngologist, and is effective to control epistaxis. The clinical result of this method for recurrent posterior epistaxis is satisfactory. It is advocated in the treatment of epistaxis especially for debilitated elderly patients.

References