INTRODUCTION

Epistaxis is one of the most frequent problems in otorhinolaryngology practice and emergency medicine which occurs in up to 60% of the general population [1]. Although it is a common health problem, most of the cases are minor and self-limiting with almost 6% requiring medical treatment [2]..Epistaxis both affect children and adults and has two peaks which takes place before the age 10 and between the ages 45 and 65 [3]

Anatomy of epistaxis

Little’s area, which is also known as Kisselbach’s plexus, is the most common bleeding region of the nose. Almost 80 to 90% of epistaxis originate from this area [4]. It is located in the anteroinferior part of the nose. This plexus is the area which interacts with respired air after the external nasal valve. This plexus has the functions of blood supply and mucosal immunity, as well as warming and humidifying the respired air.

Little’s area has an intense blood supply. Most of the vessels are located superficially in this area which can easily be affected by multiple factors. Both internal and external carotid artery supplies blood to this region. Branches of anterior and posterior ethmoidal arteries, superior labial artery, terminal branches of sphenopalatine artery and palatine artery supply this area with blood and form the Kisselbach’s plexus [3,4].

Etiology of the epistaxis

Although there are various factors involved in the development of bleeding from the nose, they can be basically classified into two groups as local and systemic factors.

Local factors;

• Infectious disorders, like rhinitis and sinusitis
• Inflammatory disorders, pathologies that result in rhinitis such as allergies, autoimmune disorders
• Trauma, which is especially important in childhood. Nasal picking or rubbing can both result in bleeding and create a tendency to cause bleeding. External trauma may also cause bleeding from the nose.
• Foreign bodies, although that the most common presentation of a nasal foreign body is unilateral purulent rhinorrhea foreign bodies may also result in bleeding from the ipsilateral especially in children.
• Anatomic disorders, nasal septal deviation effects vessels’ location in the mucosa and also effects airflow which may result in crusting. Also septal perforation effects nasal airflow and result crusting and sometimes epistaxis.
• Medications such as topical decongestants and cocaine. Topical decongestants are widely used all over the world. Regular usage over a week may result in rhinitis medicamentosa which causes crusting and bleeding inside the nose. Also in clinical practice incorrect use of intranasal corticosteroids, which is widely used for various forms rhinitis, may result in epistaxis.
• Environmental factors such as cold-hot and dry air may result in crusting and bleeding. Humidification is the duty of the nose. If the weather is very dry and cold or hot, crusting and finally epistaxis may develop.
• Malignancies may also be related to epistaxis which is generally ipsilateral.
iatrogenic factors may create complications with epistaxis. Nasal and paranasal surgeries create complications of bleeding in both early and late postoperative periods. Septal perforation after surgery may present with crusting or epistaxis.

Systemic factors are generally related with the tendency of bleeding all over the body, but generally manifest with epistaxis.

- Hematologic disorders may develop recurrent epistaxis. During bleeding both platelets and blood coagulation factors interact for clot formation locally. Any disorder which effects platelet or coagulation factors may result in bleeding.

- Medications like antiaggregants or anticoagulants may develop epistaxis. Antiagregant drugs such as acetylsalicylic acid effects platelet aggregation. Anticoagulant drugs such as Coumadin effects plasma coagulation factors and inhibits clot formation [1-6]

Management

Most bleeding originates from the anterior part of the nose. Posterior bleedings are generally caused by serious problems and must be evaluated and treated with caution.

Most of the epistaxis are mild and stop spontaneously or with anterior nasal pressure.

In active bleeding as any emergent disease in the body, ABC of emergency management – airway, breathing and circulation, taking priority in any emergent situation. If necessary, intravenous hydration must be done and hypo/hypertension must be controlled. After vital functions are controlled, bleeding must be stopped.

Themanagement of epistaxis always start with anterior pressure. If epistaxis continues, even anterior pressure, topical decongestants sprays and topical solution with cotton or gauze strips must be used respectively. Topical decongestants such as 1:1000 adrenalin (epinephrine), 0.5% phenylephrine hydrochloride, 4% cocaine or 0.05% oxymetazoline solution with cotton or gauze strips are used for epistaxis [7]. If the bleeding stops with topical decongestants, further treatment should be discussed with the patient according to the severity of the bleeding. If the bleeding recurs frequently and the amount of bleeding is very high in every episode, cauterization should be recommended. Timing of cauterity should be discussed. If the patient has stopped bleeding it is better to wait until the mucosal healing and to perform more focused cautery with better visualization.

The main aim of cauterization is to destroy the mucosa of the nasal septum. In the healing process of the cauterized mucosa, it is expected to heal with scar tissue with decreased vascular structures instead of normal mucosa. Silver nitrate tip covered sticks and electrocautery are generally used for cauterization [8].

Silver nitrate is a strong oxidizing agent. When silver nitrate interacts with liquids, it precipitates and releases free radicals [9]. This chemical process oxidizes mucosa and destroys mucosal structures. The concentration of silver nitrate in sticks varies from 75% to 95% [10]. The important point in cauterization is to destroy all parts of mucosa to the cartilage. Surface cauterizations are generally inadequate and tend to recur. In deep cauterizations, generally the vessels bleed and after packing a cotton piece to the bleeding area for a few minutes, cauterization can be finished through destroying the deeper levels of the mucosa. Usually two sticks are enough; generally one is used for surface and the second is used for deep cauterization.

For silver nitrate cauterization, it is generally recommended to start making a circle around the bleeding region in question, during which the vessel is located at the centre of the circle. Cauterization is continued distally to the centre with circular movements. The vascular structure in question is cauterized finally in both surface and deep part of the mucosal layers. For the blood supply of the cartilaginous structure of the nasal septum, perichondrium is the key structure. Cauterization of deep structures of mucosa may result in prolonged crusting. Also bilaterally cauterization of the perichondrium may be risky for blood supply of the cartilaginous tissue, but if one side of perichondrium is preserved, it is generally enough for blood supply for the cartilaginous tissue [8-10].

The second common cauterization method is cauterization (bipolar or suction monopolar). The cauterization system uses thermal energy to destroy the selected region. It has the advantage of more specific region cauterization rather than silver nitrate sticks. But it is not easily available when compared with silver nitrate sticks and it is also an expensive treatment modality when compared to silver nitrate stick cauterization.

Because bleeding is generally single sided, cauterization is recommended to be performed on the bleeding side. In bilateral bleedings, bilateral cauterization may create the complication of nasal septal perforation. Cautious bipolar cauterization by trying not to cauterize the opposite sides may be used in selected cases. But generally the second side cauterization is recommended after the recovery period of the previous side. This recovery period is affected by multiple factors but generally 2-3 weeks period is necessary for healing [11].

In the follow-up period after cauterization, local ointment with saline gel or pantenol must be applied to prevent crusting and re-bleeding. Complete recovery is generally achieved in one or two weeks. During this time local oil ointments must be used. Silver nitrate cauterization has a success rate of 75%-85%.

If the bleeding is not controlled by initial interventions, nasal packaging which can be cotton, gauze, or commercially fabricated mercocel (Medtronic ENT, Jacksonville, Florida, USA), Rapid Rhino (Applied Therapeutics, Tampa, Florida, USA), Spongostan (Johnson and Johnson Ethicon Inc, USA), Surgicel (Ethicon, USA), Nasopore(Polyganics-Groningen, The Netherlands) can be used. Spongostan (Johnson and Johnson Ethicon Inc, USA) is an absorbable haemostatic gelatin sponge which is biodegradable. Nasopore(Polyganics-Groningen, The Netherlands is also biodegradable synthetic polyurethan foam. This materials provide strong initial compressive mechanical properties, whereas hydrophilic component takes-up the water or blood and is gradually fragmented.
Generally, the anterior packaging is adequate for most bleedings. If the anterior packaging cannot stop bleeding, posterior packagings, which include gauze packages or catheters like Pope nasal packing (Medtronic ENT, Jacksonville, Florida, USA) Epistat, Postpac (Medtronic ENT, Jacksonville, Florida, USA), can be used. Anterior packing are removed after two days, but posterior packing may stay up to five days according to the patients’ general conditions. Antibiotic treatment should be used until the removal of nasal packaging for preventing toxic shock syndrome which is related with staphylococcal toxins. Nasal packing have also complications of nasal discomfort, pneumocephalus, etc. Generally we recommend analgesic with antibiotic treatment. The usage of haemostatic compounds have increased in the recent years, such as Floseal (Baxter Healthcare Corp, Deerfield, Illinois, USA) [6]. Although there are several studies which show their benefit in epistaxis, their use has not become widespread. Floseal (Baxter Healthcare Corp, Deerfield, Illinois, USA) has gelatin granules which swell to produce a tamponade effect. Also high concentration of human thrombin in Floseal (Baxter Healthcare Corp, Deerfield, Illinois, USA) convert fibrinogen into fibrin monomers which accelerates dot formation.

Epistaxis which cannot be controlled by packaging must first be evaluated in the operating room under general anesthesia. Possible bleeding areas must be cauterized or vessels must be ligated [12]. Endoscopic approach the first line treatment of ligation if epistaxis can not be controlled by conventional approachs. Ethmoidal artery, sphenopalatine artery or internal maxillary artery could be ligated easily if necessary. Open ligation of anterior ethmoidal artery, facial artery, internal maxillary artery or even external carotid artery is rarely used for epistaxis after the evaluation of endoscopic nasal surgery. Interventional radiology may be helpful in intractable epistaxis cases. Angiography and selected embolisation of the vessel may be necessary in selected cases. Although highly selective embolization could be made by interventional radiology, there are some complications related with this approach. The complications including stroke and blindness must be discussed before embolisation procedure with patient [13].

Medical therapy in epistaxis is not used commonly. Antifibrinolytics, such as aminocaproic acid and tranexamic acid are used as inhibitors of fibrinolysis. This drugs stop plasmin formation with binding to the precursor enzymes or plasminogen [14]. In severe epistaxis or patients with coagulopathies, fresh frozen plasma must be used [15].

Sclerotherapy, septodermoplasty, hormonal therapy (specially in cases of hemotological diseases) are recommended in chronic epistaxis. Sodium tetradecyl sulfate is used for sclerotherapy in chronic epistaxis [16] Septodermoplasty is the removal of affected nasal epithelium and its replacement with a pllt thickness skin graft [17]. Systemic estrogen-progesterone at doses for oral contraception may be helpful in chronic epistaxis [18].

Because of reflexive flexion of the head during epistaxis, blood from nose goes down through the face. Plenty of blood running down the face and the body may also result in some vagal symptoms such as hypertension, rhythm problems of heart and even fear of death. Hypertension results in higher amounts of bleeding. This vicious cirle also creates bleeding.

CONCLUSION

Epistaxis is a common health problem which effects large populations all over the world. Although most epistaxis cases are self limiting, sometimes bleeding may result in severe conditions. Anatomy, etiology and management of epistaxis must be known by every otorhinolaryngologist and emergency doctor because of the high incidence rates of epistaxis. New treatment options such as haemostatic compounds or haemostatic packages help physicians’ management. Surgical intervention and embolisation are the options in cases in which failure of conservational management methods fail.

REFERENCES

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Cite this article