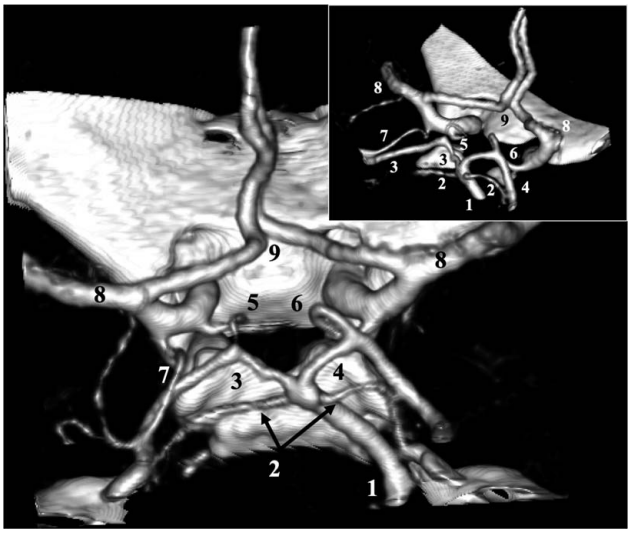

FIGURE 1. The cerebral arterial circle of the patient, in 3-dimensional reconstruction. (1) basilar artery, (2) superior cerebellar arteries, (3) left posterior cerebral artery, (4) right posterior cerebral artery, (5) left posterior communicating artery, (6) right posterior communicating artery, (7) accessory posterior cerebral artery/hyperplastic anterior choroidal artery, (8) middle cerebral arteries, and (9) anterior cerebral arteries.

PComA, which accounted for a prevalence of 0.46%. Conversely, 2 cases presented with an absent PCA, resulting in a prevalence of 0.09%. The rarest documented variant was a complete duplication of the PCA, identified in one case (0.04%) in which an APCA originated from the ICA. At the same time, the PCA remained typical, and the PComA was absent.[1]

Uchino et al[1] proposed that the APCA, alongside a typical PCA and PComA, should be classified as "hyperplastic AChA," given that the AChA supplies a portion of the PCA territory. In contrast, when the PCA is absent, the AChA is responsible for providing the entire PCA territory, thus warranting designation as a "replaced PCA." Consequently, the present case of APCA is best described as "hyperplastic AChA," which aligns with the conclusions drawn by Uchino et al[1]

Limited case reports have examined the variants detailed in the study by Uchino et al[1] For instance, Rusu et al[4] documented a rare case of unilateral PCA duplication featuring a hyperplastic AChA functioning as an APCA, where both the PCA and PComA were typical, analogous to the current case. Uchino and Tokushige[5] identified 2 right PCAs—one arising from the ICA and the other from the PCA—thus presenting both a typical PCA and a "hyperplastic AChA" variant. However, they noted an anastomosis between the 2 PCAs.

The APCA variant is scarce alongside other cerebral arterial variations. Uchino and Irie[6] reported an instance of "hyperplastic AChA" coexisting with a fetal-type PCA and an accessory middle cerebral artery. Another uncommon case was described by Rusu et al,[7] who identified a duplicated PCA in conjunction with BA fenestration, a bihemispheric anterior cerebral artery, and pericallosal artery fenestration.

The present report presents an APCA case corresponding to the hyperplastic AChA variant. This variant is seldom mentioned in the current literature, with a reported prevalence of 0.46%.[1] Although this anatomic configuration is atypical, it is crucial to underscore that the internal carotid and vertebrobasilar circulations perfuse the PCA territory. Accordingly, clinicians are advised to consider this information when evaluating cases of embolic strokes.

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Noninvasive Approach to Postoperative Bleeding in Patients Undergoing Septorhinoplasty Surgery

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Objectives: In this study, we retrospectively examined the bleeding that occurred in the 5-year patient series.

Materials and Methods: One thousand seven hundred seventy-five patients who underwent septorhinoplasty surgery between 2019 and 2023 were included in the study, and 28 of these patients who presented with bleeding complications were examined. All patients underwent open-technique septorhinoplasty surgery with or without concha intervention and were discharged the next day after overnight hospitalization.

Results: Of the 1775 patients included in the study, 1415 (79.7%) were female and 360 (20.3%) were male. Bleeding was observed in a total of 28 cases (1.6%). There was no difference regarding

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age or sex in patients with bleeding. It was also observed that concha intervention did not make a difference in terms of bleeding. The bleeding period ranged from 1 to 9 days, with an average period of 5.53 ± 2.36 days and a median bleeding period of 6 days. All bleeding patients were followed up with supportive treatment and were discharged after a 24-hour bleeding-free period. There was no need for interventions in the operating room or blood transfusions in for any patient.

Conclusion: Patients who present with bleeding after rhinoplasty can be observed, and their bleeding can be controlled without further intervention with supportive treatment and sufficient time.

Key Words: Nosebleed, postoperative complication, rhinoplasty, septorhinoplasty

The blood supply of the nose is provided from both the external and internal carotid systems. Both the outer and inner parts of the nose are fed by extensive vascular networks originating from these 2 arteries.[1–3] Bleeding is one of the most likely complications that can occur after nose surgeries. The risk of bleeding complications has been reported at various rates in various studies.[1,2,4] Because of the widespread vascular network and strong blood supply of the nose, bleeding is usually severe.[5] When nosebleeds are encountered, they are quite frightening and uncomfortable for the patient and their relatives. Bleeding also causes a high degree of stress for the professionals who perform the surgery.

Rhinoplasty is one of the most common surgeries performed worldwide. Bleeding is the most common complication of this surgery.[1,6,7] Therefore, it has a great importance to manage this complication appropriately.

In this study, we aimed to contribute retrospectively to management of this issue examining bleeding in a large series of rhinoplasty and sharing our experiences with clinicians.

MATERIALS AND METHODS

Patients who underwent septorhinoplasty surgery between 2019 and 2023 were selected. Between these years, a total of 1775 patients underwent septorhinoplasty at our clinic. During the preoperative follow-up of the patients, complete blood counts and bleeding tests were examined, and patients who were not within the normal limits were excluded from the study. Patients with normal preoperative blood tests and bleeding parameters were included in the study. Those with chronic diseases such as heart failure, renal failure, liver failure, uncontrolled diabetes, and uncontrolled hypertension were excluded from the operations.

During surgery, for surgical infection prophylaxis, 1 g of cefazolin was intraoperatively applied to the patients. Open technique septorhinoplasty was performed on all patients either with or without concha intervention, and after surgery, intranasal Doyle splints, bandages, and thermal plasters on the back of the nose were kept on for 7 days and then removed on the eighth day.

The patients were then discharged and prescribed amoxicillin/clavulanate 1000 mg tb 2*1, paracetamol 500 mg tb 2*1, desloratadine 5 mg tb 1*1, bacitracin + neomycin sulfate pomade 2*1, and multivitamin complex + zinc effervescent tb 1*1. Patients were prescribed isotonic NaCl for nasal washing and were taught to wash their noses squeezing with a 20 ml syringe into both nostrils every 3 hours.

A total of 28 postoperative patients presented to our clinic with postoperative bleeding. Of these, 23 patients were female and 5 were male. The average time of admission for these patients was the sixth day after surgery (5.53 ± 2.36).

All patients who presented with bleeding were taken to an appropriate intervention room, and their vital values were checked. The patients were calmed by sharing the fact that bleeding was a possible postoperative complication. Pads saturated with oxymetazoline as an intranasal decongestant were placed bilaterally in the nose and stayed for 15 minutes in the intervention room then the patients were hospitalized to be followed up and observed for the purpose of alleviating the bleeding. The hemogram, hematocrit, and platelet values of the patients were examined and compared with the preoperative values. A treatment involving parenteral intravenous transamine 5%, 5 mg 1*2, isotonic NaCl 500 ml 2*1 treatment was applied to the patients. At the same time, with the help of ice gels, cold application was applied to the cheek–brow area and neck area for 10 minutes every hour. No patients needed blood transfusions during hospitalization, and no patients were taken to the operating room under general anesthesia for bleeding control. The patients were observed for 24 hours during hospitalization, and then they were discharged with recovery and lack of bleeding. Four patients presented with bleeding again after being discharged and were discharged after undergoing the same management process.

RESULTS

A total of 1775 patients [1415 (79.7%) female patients and 360 (20.3%) male patients] aged between 15 and 63 years were examined in the study. The mean age was 27.57 ± 8.20 years. Bleeding was observed in 28 cases (1.6%).

There was no statistically significant relationship between the patients with bleeding and the patients without bleeding in terms of mean age ($P > 0.05$). There was also no statistically significant relationship between bleeding and sex ($P > 0.05$). 82.1% of the patients with bleeding and 79.7% of the patients without bleeding were female, and there was no statistically significant difference between them ($P > 0.05$) (Supplementary Table 1, Supplemental Digital Content 1, http://links.lww.com/SCS/H284).

Evaluations of bleeding cases (n = 28);

The ages of the patients with bleeding ranged from 19 to 48 years, with a mean age of 27.93 ± 7.15 years. Twenty-three (82.1%) were female and 5 (17.9%) were male. The bleeding day ranges from day 1 to day 9, with an average of 5.53 ± 2.36 and a median bleeding day of 6 days. SRP and SRP+RF procedures were applied to 57.1% and 42.9% of the bleeding cases, respectively, and there was no statistically significant difference between them ($P > 0.05$). 39.3% of the bleeding foci were from the lateral osteotomy line, 25% from the inferior concha, 21.4% from the upper part of the middle meatus and 14.3% from the septum, and there was no statistically significant difference between them ($P > 0.05$) (Supplementary Table 2, Supplemental Digital Content 2, http://links.lww.com/SCS/H285)

The decrease in the postoperative period compared with the mean hemoglobin in the preoperative period was statistically significant (p:0.001). The decrease in the postoperative period compared with the mean hematocrit in the preoperative period was statistically significant (p:0.001). There was no statistically significant change in the postoperative period compared with the mean platelet count in the preoperative period ($P > 0.05$) (Supplementary Table 3, Supplemental Digital Content 3, http://links.lww.com/SCS/H286).

Statistical Analysis

While evaluating the findings obtained in the study, IBM SPSS Statistics 22 program was used for statistical analysis. The conformity of the parameters to the normal distribution was evaluated with the Shapiro-Wilks test. While evaluating the study data, Mann-Whitney U test was used to compare the descriptive statistical methods (Mean, Standard deviation, frequency) between the 2 groups of parameters that did not show normal distribution. Paired sample t test was used for preoperative-postoperative comparisons of normally distributed parameters. In the comparison of qualitative data, Continuity (Yates) correction and 1-eyed χ^2 test were used, and the significance was evaluated at the level of $P < 0.05$.

DISCUSSION

Our approach to our patients with bleeding was based on the principle that a patient without a pathology related to hemostasis can stop without any further intervention when enough time is allowed by supportive treatment and hospitalization. As a matter of fact, all 28 patients who applied with bleeding were treated with this understanding and followed up by hospitalization with supportive treatments, and no intervention was required in operating room conditions in any of the patients. At the time of admission, all patients were administered oxymetazoline as an intranasal decongestant by impregnating the pads, and the patients were hospitalized with medical hospitalization. During hospitalization, iv. Transamine, hydration and cold application were performed. A blood test was performed to determine the possible amount of bleeding in the patients during admission with bleeding and the parameters were checked. No patient required blood transfusion during hospitalization. The patients were observed for 24 hours during hospitalization and the patients were discharged with recovery after there was no bleeding.

Oxymetazoline is a frequently used nasal decongestant in routine practice. It creates vasoconstriction by stimulating alpha-adrenergic receptors in arterioles in the nasal mucosa. Blood flow to the tissue decreases with vasoconstriction. With a decrease in blood flow, the amount of bleeding decreases and is useful in epistaxis control.[8,9]

Krempl and Noorily[9] investigated the use of oxymetazoline in epistaxis control in patients in a study of 60 patients, and epistaxis control was achieved with oxymetazoline alone in 65% of patients. Patients did not need nasal tampons.

According to the study conducted by Kayiran and Calli,[10] postoperative periorbital cold application was found to be significantly beneficial in edema, ecchymosis and pain control. It is sufficient to apply cold application at intervals for the first 3 days. Although cold application in the first hour after surgery was not significant in pain control, edema, and ecchymosis were less common.[10,11] Cold application was also applied to our patients during their hospitalization. Cold application reduces blood flow to the tissue by vasoconstriction. The benefit of cold application in the treatment of ecchymosis and edema has been demonstrated. These benefits depend on a decrease in blood flow to the tissue. Cold application in bleeding control is thought to reduce blood flow to the tissue with a similar mechanism and reduce bleeding.

Transamine forms a reversible complex that removes plasminogen from fibrin and results in inhibition of fibrinolysis; it also inhibits the proteolytic activity of plasmin.[12] In the meta-analysis in which 1299 patients were included, it was shown that patients who preferred transamine as an epistaxis treatment were significantly more likely to stop bleeding, and admissions were less with re-bleeding in 24-72 hours.[13]

Zaman et al[14] associated postoperative bleeding with fibrinolysis in their study. The degradation time of the clot around the septum was evaluated as the first week and it was observed that there was bleeding again due to fibrin degradation in the blood vessels together with fibrinolysis. In their study, stopping fibrinolysis with transaminic acid administration resulted in the termination of epistaxis, and in these hypotheses, the mechanisms that reverse fibrinolysis are successful in epistaxis control.[15]

In our study, the bleeding time of 28 patients who applied with bleeding was statistically sixth day and this was found to be compatible with the fibrinolysis stage in wound healing. Increased bleeding with fibrin degradation on the sixth day in our study. Sixth day and controlling bleeding with transaminic acid administration was beneficial in bleeding control in our study, as in our practical application.

The most important mistake made in postoperative bleeding management is the effort to reduce bleeding to zero in the first intervention when the patient comes to us. Although the clinician is trying to do this, new bleeding areas can be opened with the interventions and the patient's blood pressure may increase with the increase in anxiety. This situation can often cause bleeding not to stop or even increase. As a result, the patient can be taken to the operating room with non-stop bleeding.

CONCLUSION

As a summarize, in this study our approach was as follows;

1. Comforting and reassuring the patient
2. Hospitalization
3. Applying intranasal decongestions
4. Applying cold
5. Parenteral transamine treatment
6. 24-hour observation and after discharging without bleeding

With our 5-year experiences, we showed that the bleeding complication can be controlled without the need for further interventions in patients without underlying hemostasis disorder with reducing the patient's anxiety, hospitalization and supportive treatment.

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Risk Factors and Treatment Strategies for Subcutaneous Effusion Secondary to Cerebrospinal Fluid Leakage After Craniotomy

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Objective: To confirm the incidence of subcutaneous effusion secondary to cerebrospinal fluid leakage after craniotomy, analyze the risk factors for cerebrospinal fluid leakage leading to subcutaneous effusion, summarize the underlying causes of its occurrence and explore the corresponding treatment strategies.
Methods: A retrospective analysis was conducted on 757 patients who underwent craniotomy at our hospital from January to December 2023. The authors documented the sex, age, surgical characteristics, and history of chronic diseases for all patients, including those who developed subcutaneous effusion secondary to cerebrospinal fluid leakage. These factors were subjected to univariate regression analysis, and the identified risk factors were evaluated in a multivariate regression analysis.
Results: Among 757 patients who underwent craniotomy, 15 developed subcutaneous effusion secondary to cerebrospinal fluid leakage, representing an incidence of 1.98%. This group included 5 patients with acoustic neuroma surgery, 4 with neurovascular decompression, 4 with meningioma surgery, 1 patient undergoing a posterior corpus callosotomy for epilepsy, and 1 patient with cerebellar cavernoma resection. Factors such as acoustic neuroma surgery, neurovascular decompression, infratentorial surgery, longer surgical durations, larger cranial bone removals, higher body mass index, and smoking were associated with an increased risk of developing subcutaneous effusion secondary to cerebrospinal fluid leakage. The average time to onset was 40.8 ± 37.16 days. Three patients with subcutaneous effusion experienced elevated body temperatures, with one testing positive in blood cultures; no other complications were noted. All patients initially received conservative treatment and subsequently underwent surgical repair for the cerebrospinal fluid leak an average of 45.4 ± 57.94 days later, ultimately resulting in recovery and discharge.
Conclusion: In 2023, the incidence of subcutaneous effusion secondary to cerebrospinal fluid leakage after craniotomy at our hospital was 1.98%. The fundamental cause of this complication is the pressure difference between the inside and outside of the dura mater, leading to incomplete dural closure and subsequent fluid leakage. Factors such as younger age, acoustic neuroma surgery, neurovascular decompression, infratentorial surgery, longer surgery durations, larger cranial bone removals, higher body mass index, and smoking are associated with an increased risk of subcutaneous effusion. Once subcutaneous effusion occurs, conservative management is the initial step. To optimize outcomes, surgical repair of the cerebrospinal fluid leak should follow conservative treatment. This approach can significantly reduce the likelihood of treatment failure, decrease hospital stays, and cut unnecessary costs.

Key Words: Cerebrospinal fluid leakage, craniotomy, risk factors, subcutaneous effusion, treatment strategies

Subcutaneous effusion secondary to cerebrospinal fluid (CSF) leakage is a common complication after intradural craniotomy, potentially leading to severe consequences such as infection at the wound site, delayed healing, meningitis, and reduced intracranial pressure. These issues can extend hospital stays and increase treatment costs.[1] The mechanism involves changes in cerebrospinal fluid production and circulation post-surgery, where arachnoid membrane rupture allows cerebrospinal fluid to flow between the arachnoid and dura mater. If the dura mater's integrity is compromised, forming a flap-like tear, cerebrospinal fluid continues to seep into the subcutaneous space without returning to the dural space, causing the effusion to expand continuously. Factors such as incomplete dural closure, infection, and the presence of dead space are believed to contribute to this complication.[2] Although post-surgical inflammatory tissue reactions and exudation can also lead to subcutaneous effusion, their treatment is relatively straightforward and typically involves simple compressive dressing; hence, they are not the focus of our discussion. To date, the incidence and risk factors for subcutaneous effusion secondary to cerebrospinal fluid leakage have not been clinically validated in general neurosurgical patients undergoing intradural craniot-

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