Radiofrequency coagulation versus liquid paraffin plus antiseptic cream in the treatment of recurrent anterior epistaxis

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DATA

Abstract  Objectives: To evaluate the efficacy of radiofrequency coagulation and to compare it with that of liquid paraffin plus antiseptic cream in the management of recurrent anterior epistaxis.
Design: Prospective clinical trial. Between February 2011 and July 2012, one hundred consecutive patients with histories of recurrent anterior epistaxis were randomly assigned to receive treatment consisting of either a combination of liquid paraffin plus antiseptic cream (group 1) or radiofrequency coagulation (group 2).
Setting: Benha University Hospital.
Main outcome measures: The Epistaxis Severity Score; before treatment, at 4, 12 weeks, 6 and 12 months after treatment, participant’s perception of discomfort during the management and complications.
Results: The severity score of the 94 patients who had full data at 4 weeks after treatment shows no statistically significant differences between the two groups. However, at 12 weeks; 85% of the radiofrequency group versus 40% of paraffin-antiseptic group patients had reported no bleeding. At 6 months; 74% of the radiofrequency group versus 25% of the paraffin-antiseptic group patients reported no bleeding. At 12 months, 70% of the radiofrequency group versus 23% of the paraffin-antiseptic group patients reported no bleeding. Both groups had no complications. The level of pain associated with the procedure was tolerable. Mean duration of the radiofrequency procedure was 14.2 min.
1. Introduction

Epistaxis, one of the most commonly encountered problems in otorhinolaryngological medical practice, has been shown to affect 10% of the population.\(^1\) Up to 60% of people experience epistaxis in their lifetime,\(^2\) and it has a reported incidence of 6 cases/10,000 people/year.\(^3\) The fragile anterior septal mucosa is the source of bleeding for more than 90% of all patients with epistaxis.\(^4\) In this area, the Kiesselbach plexus, which is an anastomotic network of vessels on the anterior portion of the nasal septum, acts as a common source of bleeding.\(^5\),\(^6\)

The aetiology of epistaxis can be divided into local and general causes. The prevalent local causes are trauma, inflammation, neoplasia, and vascular or structural anomalies; the general causes include hypertension, antiplatelet drugs or haematological disorders. Although local and general causes can occasionally be identified, the majority of cases (80–90%) are idiopathic.\(^7\)

Although epistaxis is associated with significant morbidity, it has a comparatively low mortality. The natural history of the problem is one of intermittent, recurrent and usually minor bleeds, which alarms both adults and children. There are many ways to achieve haemostasis in this region, such as by applying pressure to the nostrils, topical haemostatic or vasoconstricting agents, anterior nasal packing, chemical or electrical cautery, cryotherapy, hot water irrigation and laser therapy.\(^8\)

The optimal epistaxis treatment would accomplish permanent haemostasis with minimal pain, minimal bleeding or rebleeding and with limited impact on the patients’ daily activities. Unfortunately, there is limited evidence in the literature on how to best manage and prevent recurrent epistaxis.

Antiseptic creams and liquid paraffin are safe and cost-effective treatments, which are conventionally used. It has been reported that antiseptic cream is as effective as chemical cautery and that it is more effective than any other treatment.\(^9\) However, its effect may not be lasting. In our practice, we have observed a longer-lasting effect using radiofrequency coagulation. Radiofrequency coagulation is a relatively new method for the treatment of epistaxis, and has the advantage of causing minimal thermal damage to the surrounding mucosa and submucosal structures. The therapeutic effects of radiofrequency on epistaxis were investigated and compared to those of laser treatment, the results of these techniques were found to be similar, but radiofrequency was simpler, easier to perform and less expensive than laser treatment.\(^10\) Therefore, we decided to compare the effectiveness of radiofrequency coagulation and liquid paraffin plus antiseptic cream in controlling recurrent epistaxis, as well as the subjective level of discomfort associated with each management strategy.

2. Methods

2.1. Participants

One hundred patients who suffered from long-term (> one year) recurrent anterior epistaxis were included in this study. The patients presented to the Otolaryngology outpatient clinic at the Benha University Hospitals between February 2011 and July 2012.

After license from the University Ethics Committee, informed consents were signed. Adult patients with recurrent anterior epistaxis determined by anterior rhinoscopy and endoscopy were included in this study. All patients had a normal full blood picture and normal coagulation test values.

The following exclusion criteria were used: nasal masses, active haemorrhage with risk of mortality, epistaxis after a nasal operation, hereditary haemorrhagic telangiectasia, duration of symptoms <1 year, chemical cautery within 1 month, posterior epistaxis evaluated by endoscopy, pregnancy, age <18 years and systemic diseases such as known bleeding disorders and untreated hypertension.

2.2. Trial design and procedures

A prospective, randomised, single-blinded study was undertaken. All patients received routine care when seen in the clinic, consisting of history, physical examination and tests and nasal endoscopy. All patients were randomly allocated to one of the two treatment groups via sealed envelopes. Patients were sequentially assigned to a treatment group by the same physician; however, another physician blinded to the rest of the study conducted the follow-up and assessed all the patients.

Group 1 received liquid paraffin plus antiseptic cream (locally prepared, containing 0.5% neomycin and 0.1% chlorhexidine) for 4 weeks (3 times/day, 0.5 mL/time; liquid paraffin first, antiseptic cream 10 min later) directly in the nose without packs.

Group 2 received radiofrequency coagulation once with no additional interventions or medications. Radiofrequency treatments were performed in the operating room under local anaesthesia. Once the patient was in the operating room, we moistened the nose and removed crusts and blood clots with gentle saline rinses. The septal mucosa was then infiltrated with a solution containing local anaesthetic and a vasoconstrictive agent (1% lidocaine and 1:200 000 epinephrine) to achieve a more prominent visualisation and identification of the bleeding vessels. Radiofrequency bipolar coagulation (RF Cautery, Busco, India) was performed at power number 2 under magnification using an anterior rhinoscope and magnifying glasses or the nasal endoscope. Every single bleeding vessel or point was coagulated. If bleeding was encountered during the operation, a cotton pledget with vasoconstrictor was applied for
minutes to stop the bleeding and the radiofrequency power was then increased. When no further telangiectasias or bleeding was visualised, the process was discontinued. No packing of the nose was planned.

2.3. Data collection and follow-up

All of the participants completed questionnaires before and after treatment. The data that were collected and recorded included demographic parameters, severity of bleeding (according to the Epistaxis Severity Score), the number of applications of liquid paraffin and cream or radiofrequency, pain experienced during the procedure, and complications.

The Epistaxis Severity Score (ESS), developed by Hoag et al., was applied as a standard measurement for pre and post-operative epistaxis severity. The score includes the assessment of six factors reflecting severity. These factors are: frequency of bleeding episodes, average bleeding duration, intensity of average bleeding episodes, seeking medical attention for nose bleeding, the presence of anaemia, and the need for blood transfusion specifically related to epistaxis. The score was originally made for assessing hereditary haemorrhagic telangiectasia – related epistaxis, but it can be applied to any case of epistaxis. It gives a ‘raw’ score that is converted mathematically to a ‘normalised’ score ranging from 1 to 10 and this score is further categorised into 4 grades; None (0–1), Mild (2–4), Moderate (>4–7), and Severe (>7–10).

With the use of a 10-point visual analogue scale (VAS), the patients estimated the pain experienced during the procedure (0 = no discomfort, 10 = unbearable).

2.4. Statistics

Data were analysed using the SPSS 16 software programme (IBM, New York, USA). Demographic data were collected, and they are presented as the mean ± sd and mean rank. The paired-samples t-test was used for means, the Mann–Whitney U test for mean rank, and the chi-square test was used for gender percentages. A 95% confidence interval was used, and P-values < 0.05 were considered significant.

3. Results

A total of 100 consecutive patients (59 males, 41 females), aged 18–61 years, with recurrent anterior epistaxis were included in the study. The data for six patients (two from group 1 and four from group 2) were lost, while the remainder of the patients (94: 55 males, 39 females) completed the trial. Of the 94 patients, 48 were included in group 1, and the remaining 46 were included in group 2. The mean ages were 35.4 for group 1 and 39.1 years for group 2 (Table 1). The baseline characteristics of each group are shown in Table 1, which demonstrates that the groups were well matched. There are no statistically significant differences in the characteristics between the two groups.

For group 2, the pain associated with the procedure, the length of time required and the bleeding situation during the procedure are shown in Table 2. The median and mean ± sd

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Patients characteristics of each group.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group 1</td>
</tr>
<tr>
<td>Randomised</td>
<td>50</td>
</tr>
<tr>
<td>Excluded</td>
<td>2</td>
</tr>
<tr>
<td>Age (mean ± SD)</td>
<td>35.4 ± 22.3</td>
</tr>
<tr>
<td>Sex (M:F)</td>
<td>30/18</td>
</tr>
<tr>
<td>ESS (severity)</td>
<td>5.3 (moderate)</td>
</tr>
<tr>
<td>Duration of symptoms (years) (mean ± SD)</td>
<td>4.23 ± 6.4</td>
</tr>
</tbody>
</table>

**Associated factors**

<table>
<thead>
<tr>
<th></th>
<th>Group 1 (%)</th>
<th>Group 2 (%)</th>
</tr>
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<tbody>
<tr>
<td>Idiopathic</td>
<td>30 (62.5%)</td>
<td>32 (69.5%)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Anticoagulants</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Allergic rhinitis</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Chronic sinusitis</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Others</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

**Bleeding source**

<table>
<thead>
<tr>
<th></th>
<th>Group 1 (%)</th>
<th>Group 2 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nasal septum</td>
<td>43 (89.5%)</td>
<td>42 (91.3%)</td>
</tr>
<tr>
<td>Inferior turbinate</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>other sites</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Intra-operative pain, procedure duration and bleeding situation (for group 2).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of patients (%)</td>
</tr>
<tr>
<td>Procedure duration (minutes)</td>
<td>46</td>
</tr>
<tr>
<td>VAS of pain/discomfort</td>
<td>46</td>
</tr>
<tr>
<td>Intra-operative bleeding</td>
<td>13 (28.3)</td>
</tr>
<tr>
<td>No bleeding</td>
<td>33 (71.7)</td>
</tr>
</tbody>
</table>
pain levels experienced during the coagulation operation were 4.8 and 5.2 ± 2.3, which are levels that can be tolerated. The duration of the radiofrequency coagulation ranged from 5 min to 27 min, with median and mean ± standard deviation (SD) values of 12.5 min and 14.2 ± 8.7 min.

In group 2, all of the patients were able to go home on the day of surgery and resume their daily activities. There was no retained material in the nasal cavity of most patients, with the exception of three patients who required a piece of merocele sponge in their nasal cavity to prevent bleeding. It was removed on the second day. Thus, in general, the patients did not feel any discomfort after treatment, and the therapy did not affect their activities.

The severity score of the 94 patients at 4 weeks after treatment shows no statistically significant difference between the two groups. At 12 weeks; 85% of radiofrequency group versus 40% of paraffin-antiseptic group patients had reported no bleeding. At 6 months; 74% of the radiofrequency group versus 25% of paraffin-antiseptic group patients reported no bleeding. At 12 months, 70% of radiofrequency group versus 23% of paraffin-antiseptic group patients reported no bleeding (Table 3).

Five patients from group 1 had worsening outcomes and underwent radiofrequency coagulation after the conclusion of the study. Additionally, two patients from group 2 whose original symptoms persisted underwent radiofrequency coagulation for a second time after the conclusion of the study. Both groups had no complications, such as visible nasal scars, nasal adhesions, nasal septum perforation, blood transfusion or hospitalisation.

4. Discussion

Up to our best knowledge, there are currently no comparative studies between radiofrequency coagulation and liquid paraffin plus antiseptic cream in the treatment of recurrent epistaxis.

This study has demonstrated that radiofrequency coagulation is a safe, convenient and simple procedure that is associated with a significant improvement of epistaxis for a reasonable period. After one year of the procedure, 70% of patients had no epistaxis, which matches with the results of different laser treatments for epistaxis. but radiofrequency application is simpler and less expensive than LASER. The procedure was performed under local anaesthesia with a mean duration of 14.2 min reflecting another advantage of time saving. This procedure is also associated with tolerable levels of pain and allows patients to resume work and other daily activities in a short period of time (the second day). There were no recorded complications.

Antiseptic cream has been used in a number of studies and has been shown to be as effective as chemical cautery and even more effective, but does not have long lasting results and its effect is temporary. Petroleum jelly (Vaseline) and liquid paraffin have also been used by otolaryngologists for many years as a safe, cost-effective treatment for epistaxis. The evidence base for the efficacy of liquid paraffin is limited. Although several case reports show a link between liquid paraffin and paraffinoma, the topical application of paraffin only has negligible epidermal penetration and has not been shown to have any adverse effects in multiple species.

The combination of liquid paraffin and antiseptic cream is also a safe and easy intervention for recurrent epistaxis. This treatment causes no pain and little discomfort. However, this treatment requires long-term application, which requires patient compliance. Lack of compliance can, therefore, result in a lack of efficacy. Bleeding recurred in most patients after a short period of stoppage of treatment.

In our study, 66% of the patients had idiopathic epistaxis, which did not match the prevalence of 80–90% noted in the literature. This difference may be due to the smaller sample size in our study. The most common source of bleeding was the nasal septum; 90% of the patients exhibited bleeding from this site, a prevalence similar to that described in the literature.

Although there are some weaknesses in the study regarding sample size and follow up duration, we proved that the efficacy of radiofrequency coagulation is superior to that of simple liquid paraffin plus antiseptic cream in the treatment of recurrent epistaxis, especially with regard to long-term.

5. Conclusion

Radiofrequency coagulation is a safe, convenient and simple procedure that is associated with a significant improvement in epistaxis severity in cases of recurrent anterior epistaxis. This therapy could be performed in office settings. Further studies with larger sample sizes and longer durations are recommended.

References