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GENERAL REVIEW

Leech therapy in flap salvage: Systematic review and practical recommendations

Utilisation des sangsues dans le sauvetage des lambeaux : revue systématique, mise au point et recommandations d'usage

C. Herlin^{a,b,c,*}, N. Bertheuil^d, F. Bekara^{a,b,c}, F. Boissiere^{a,b,c},
R. Sinna^e, B. Chaput^f

^a Service de chirurgie plastique et reconstructrice, centre des brûlés, CHRU Lapeyronie, 325, avenue du doyen-Gaston-Giraud, 34295 Montpellier cedex 5, France

^b Service de chirurgie plastique et craniofaciale pédiatrique, CHRU Lapeyronie, 34295 Montpellier, France

^c Unité de plaies et cicatrisation, CHRU Lapeyronie, 34295 Montpellier, France

^d Service de chirurgie plastique, reconstructrice et esthétique, CHRU de Rennes, 35000 Rennes, France

^e Service de chirurgie plastique, reconstructrice et esthétique, CHRU de Picardie, 80080 Amiens, France

^f Service de chirurgie plastique, reconstructrice et esthétique, CHRU de Rangueil, 31400 Toulouse, France

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Summary

Introduction. — Medicinal leeches have been part of the therapeutic armamentarium of plastic surgeons for more than 50 years. While their use in hand surgery is a matter of course, their use in salvage of flaps with venous congestion remains facultative depending on teams.

Materials and methods. — We conducted a systematic review of leech therapy for flap salvage between 1960 and 2015, analyzing 121 articles and subsequently taking into consideration 41 studies. In parallel, we collected data from 43 patients for whom leech therapy had recently been applied in treatment of venous insufficiency in pedicled or free flaps after revision surgery had failed to improve flap vascularization, or in cases where flap revision was not appropriate. The data collected pertained to relevant indications, treatment procedure, efficacy, adjuvant therapies, side effects and complications.

Results. — For this indication, the success rate of leech therapy ranged from 65 to 85% (83.7% in our series) according to the situations encountered. Optimal frequency of application ranged from 2 to 8 hours, while average overall duration ranged from 4 to 10 days. The number of

* Corresponding author at: Service de chirurgie plastique et reconstructrice, centre des brûlés, CHRU Lapeyronie, 325, avenue du doyen-Gaston-Giraud, 34295 Montpellier cedex 5, France.

E-mail address: drchristianherlin@gmail.com (C. Herlin).

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leeches to be applied can be determined depending on volume of the flap. In 50% of the cases reported in the literature, the patients required transfusion. Antibiotic prophylaxis against *Aeromonas* is highly advisable. A ciprofloxacin and trimethoprim-sulfamethoxazole combination currently appears as the most relevant prophylactic antibiotherapy.

Conclusion. – Hirudotherapy is a reliable treatment in cases of patent venous insufficiency of pedicled or free flaps (or when revision surgery is not recommended). Even though the relevant literature is highly heterogeneous, we have attempted to put forward a specific protocol bringing together dosage, delivery route, frequency of administration and appropriate prophylactic antibiotherapy. An algorithm for treatment and management of venous congestion and a practical information sheet have been placed at the disposal of plastic surgery teams.

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MOTS CLÉS

Sangsues ;
Lambeaux ;
Biothérapie ;
Revue

Résumé

Introduction. – Les sangsues font partie de l'arsenal thérapeutique des chirurgiens-plasticiens depuis plus de 50 ans. Si leur utilisation est largement protocolisée en chirurgie de la main, leur utilisation pour le sauvetage des lambeaux en congestion veineuse reste une affaire d'école.

Matériels et méthodes. – Nous avons analysé 121 articles entre 1960 et 2015 puis retenu 41 études. Parallèlement, nous avons colligé les données de 43 patients récemment traités. Les données colligées portaient sur les indications, le mode d'administration, l'efficacité du traitement, les traitements adjuvants, les effets indésirables et enfin, les complications.

Résultats. – Le taux d'efficacité des sangsues dans cette indication était de 65 à 85 % en fonction des situations (83,7 % dans notre série). La fréquence d'application idéale, adaptée individuellement, se situait entre 2 et 8 heures et la durée totale moyenne entre 4 et 10 jours. Le nombre de sangsues à appliquer peut être défini en fonction de la taille et du volume du lambeau. Les patients ont nécessité une transfusion dans 50 % des cas de la littérature analysée. Une antibioprophylaxie dirigée contre *Aeromonas* est fortement conseillée. L'association triméthoprime-sulfaméthoxazole et ciprofloxacin nous paraît la plus pertinente à l'heure actuelle.

Conclusion. – L'hirudothérapie est un traitement fiable en cas d'insuffisance veineuse patente des lambeaux pédiculés ou libres lorsqu'une reprise chirurgicale n'est pas opportune. Malgré une littérature hétérogène, nous nous sommes efforcés de proposer un protocole précis englobant la posologie, le mode d'administration, le rythme et l'antibioprophylaxie adaptée. Un algorithme de prise en charge des congestions veineuses et une fiche d'utilisation sont également mis à disposition pour les équipes de chirurgie plastique.

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Introduction

Notwithstanding substantial progress in reconstructive surgery, particularly microsurgery, venous congestion in transplanted or reimplanted tissues has remained a frequent and challenging complication [1,2]. While partial venous obstruction can be physiologically offset by neovascularization over a period of 3 to 10 days [3,4], total obstruction by lumen collapse or venous thrombosis leads in 3 hours to severe microcirculatory lesions and in 8 to 12 hours to irreversible microcirculatory lesions culminating first in the "no reflow phenomenon" inside the flap, and subsequently in tissular necrosis [5]. While early revision surgery is most often of use, it does not always suffice to reestablish physiological circulation in the distressed tissue. In such cases, the use of leeches, otherwise known as hirudotherapy, is a practical technique with which all plastic surgeons are acquainted. Along with larvotherapy, it is one of the rare biotherapies currently employing complex living organisms. The most commonly used species in today's medicine is *Hirudo medicinalis*, which has been privileged due to its efficacy. Currently, only the company called Ricarimpex[®], located in the Arcachon basin, breeds leeches on an industrial scale for medicinal purposes [6].

History

While the first written evidence of hirudotherapy, in Egypt, is more than 3500 years old, actual proof of its therapeutic, by the Greek, Roman and Indian civilizations, dates back to approximately 2000 years ago [7]. Leeches were used mainly for treatment of phlebitis and hemorrhoids, and only sporadically for bloodletting. In France, François-Joseph-Victor Broussais, an early 19th-century "Napoleonic" physician practicing at the military hospital of Val-de-Grâce, who was considered as one of the most sanguinary physician in history, intensively developed the use of leeches in treatment of inflammatory diseases and as a method of "hyperstimulation" of the digestive organs. As a result of his efforts, by 1830, France had become the world leader in the field, with a hundred million leeches being put to work year in and year out [7]. Over the following decades, however, a prolonged cholera epidemic and application of the asepsis techniques advocated by Louis Pasteur prevailed over the once-fashionable application of leeches.

The 20th century was marked by a crisscrossing of contradictory tendencies. On the one hand, in 1974, reimbursement of leech treatment by French social security was

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