Technical note

J. Perinat. Med.
12 (1984) 101

Fetal razor: An aid for scalp sampling*

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The clinician's goal in the management of fetal distress is to diagnose the problem accurately and to begin treatment before fetal hypoxia leads to permanent neurologic squelae. Fetal heart rate monitoring should be considered a screening technique. If the heart rate remains normal, the chance of significant fetal acidosis is minimal. If periodic changes (either late decelerations or severe variable decelerations) occur, the sampling of fetal scalp blood can help substantiate the presence of fetal asphyxia.

HON and KHAZIN [1] have shown that the pH system has a rapid response to, and "short memory" for, occasional umbilical cord compressions. As this periodic change worsens, or as late decelerations develop, the insult is more profound and pH depression may last as long as an hour. Hence, the clinician should remember that a sample of scalp blood assesses fetal status at one moment only; as labor progresses, additional biochemical evaluations may be necessary.

Fetal scalp sampling was introduced by SALING [3]. Because of the wide disparity in the literature of normal values for the pH of fetal scalp blood during labor (7.45 to 7.25), each institution should establish its own normal range.

In order to reduce the possible adverse effects of supine hypotension, a block should be placed under the parturient so that she is in a 15° tilt to the left during the sampling procedure. The endoscope is positioned against the scalp. With proper placement, the operator should be looking up at the fetal scalp. This permits gravity to supplement capillary action in obtaining a specimen. If one depends on capillary action alone, the sample may be collected too slowly and spontaneous clotting within the tube will occur. The scalp is then carefully dried. A thin layer of silicone grease is applied so that the blood will bead up after scalp puncture and allow the sample to be obtained more readily.

Occasionally, a region of scalp free of hair cannot be found. The capillary action of the hairs will diffuse the blood sample over a wider area. Hence, an inadequate or clotted sample may be obtained. The back of either a swab or the scalp blade holder may be used to part the hairs before sampling. However, this rarely gives the operator a large enough field within which to work.

The scalp blade was designed for entering the fetal scalp to a predetermined depth. Although occasionally used to "shave" the scalp, the scalp blade is inadequate for this purpose. Fetal scalp razors are generally available at institutions evaluating transcutaneous fetal oxygen tension during labor [2]. A simple, readily reproducible fetal razor to aid the obstetrician in obtaining a fetal scalp pH has not yet been devised. Our "fetal razor" was designed to facilitate sampling in this situation (Fig. 1). A single or double-edged razor may be modified, depending on the physician's preference.

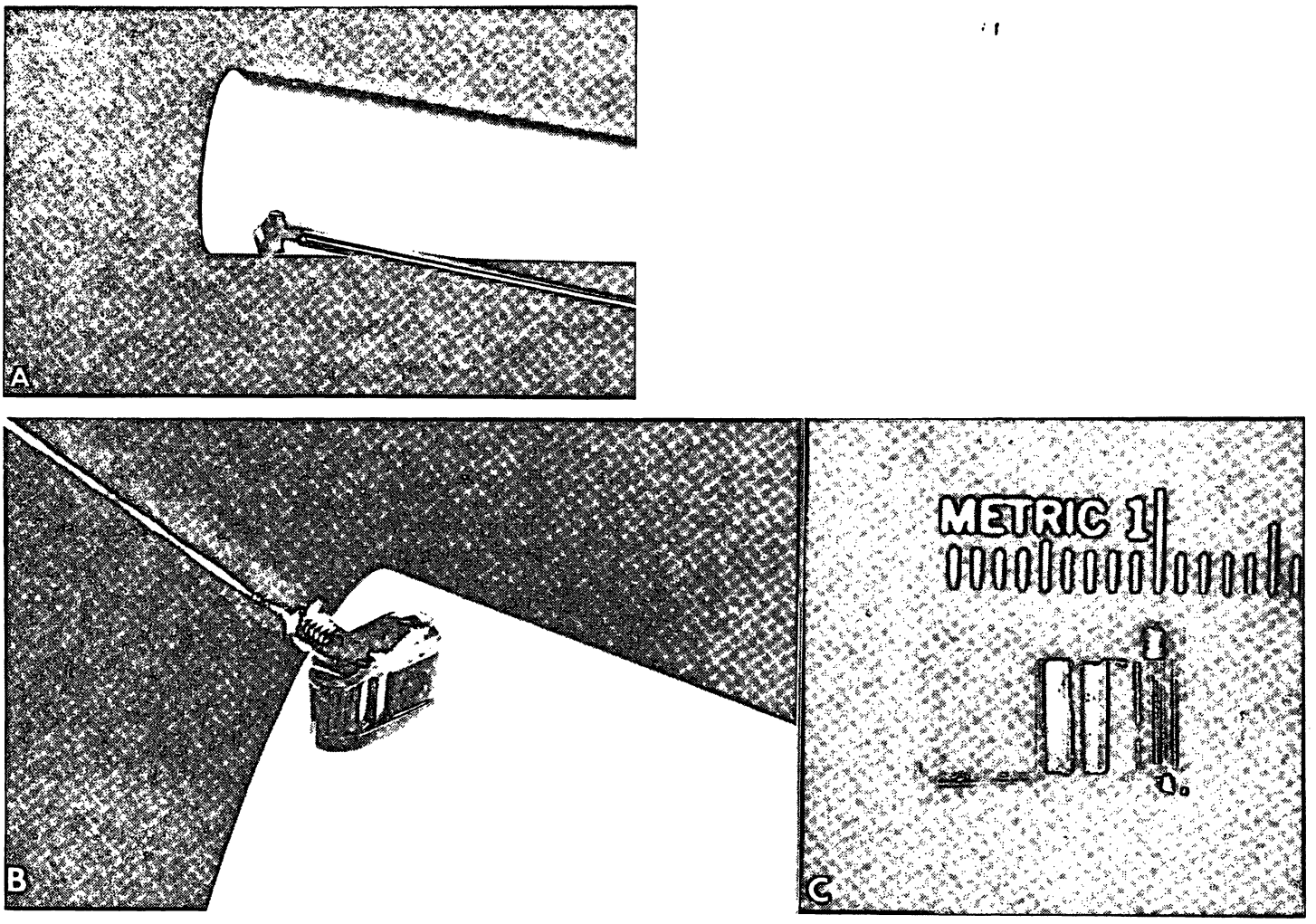

Fig. 1. **A**, Fetal razor and handle and endoscope used for scalp sampling. **B**, Close-up of fetal razor. Note protective guard opposite endoscope. **C**, Fetal razor alongside centimeter ruler.

The razor should be divided into thirds in order to permit visualization of the field through the endoscope while the fetal shave is being performed. A plastic guard is applied to the side of the blade that has been cut. This prevents gouging or nicking of the scalp during shaving. The blade and its metal adaptor permit easy sterilization and, hence, can be reused on several occasions before a new blade is required. The handle may be made the same length as the other instruments (scalp blade, capillary tubes, and so forth) within the scalp sampling kit. As a result, the field of vision is not obstructed by the hand of the operator.

The decision of when to deliver a fetus is seldom dependent solely on biochemical assessment. Clinical signs of fetal distress and the stage and progress of labor, as well as fetal acidosis, must be considered. We believe that the scalp razor will make sampling easier in particular cases and thereby increase the frequency of fetal pH determination in the assessment of fetal distress.

Summary

Scalp sampling to evaluate fetal acid-base status was introduced 20 years ago. In most instances, adequate samples may be obtained without difficulty. Occasionally, however, a region of scalp free of hair cannot be found. As a result, the sample either diffuses along the hairs that are present or clots. Although a "fetal razor" has been incorporated into the kits that are utilized to apply pO_2 electrodes to the fetal scalp, none has been devised for routine fetal scalp sampling. **We report the modification of a single or double-edged razor for this specific purpose.**

Key Words: Fetal razor, fetal scalp sampling

Zusammenfassung

Vereinfachte Blutentnahme aus dem fetalen Scalp nach Benutzung eines speziellen Rasiermessers
Vor 20 Jahren wurde die Blutentnahme aus dem fetalen Scalp zur Erfassung des Säure-Basen-Status eingeführt. In den meisten Fällen kann man die Blutprobe ohne Schwierigkeiten gewinnen. Manchmal findet sich aber am fetalen Scalp keine Stelle ohne Haare, so daß die Probe daran entlang fließt oder gerinnt. In den Kits, die zur Anlegung von pO_2-Elektroden am fetalen Scalp zur Verfügung stehen, sind „fetale Rasiermesser" enthalten. Sie sind jedoch nicht für die routinemäßige Blutentnahme aus dem fetalen Scalp vorgesehen. Wir beschreiben ein modifiziertes Rasiermesser mit einer einfachen oder doppelten Schneide für diesen speziellen Zweck.

Schlüsselwörter: Blutentnahme aus dem fetalen Scalp, Rasiermesser.

Résumé

Le rasoir fœtal: une aide pour les prélèvements
Les prélèvements au scalp pour apprécier l'équilibre acido-basique du fœtus sont apparus il y a 20 ans. Dans beaucoup de cas, on peut obtenir des échantillons adéquats sans difficulté. Néanmoins, parfois, on ne peut trouver de zône du scalp dénuée de cheveux, ce qui entraine soit la diffusion du prélèvement le long des cheveux présents, soit sa coagulation. C'est la raison pour laquelle on a incorporé un «rasoir fœtal» dans les kits utilisés pour mettre en place les électrodes à pO_2 sur le scalp fœtal; personne n'a utilisé ce système pour les prélèvements au scalp fœtal de routine. Nous rapportons la modification d'un rasoir à simple ou à double tranchant pour cet objectif spécifique.

Mots-clés: Prélèvement au scalp fœtal, rasoir fœtal.

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Received January 5, 1984. Accepted January 20, 1984.

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