OBSERVATIONS ON "JUNCTIONAL RHYTHMS" DURING ANAESTHESIA

Sir.—Changes in cardiac rate and conduction during anaesthesia may be manifest as a slow sinus rhythm or a suppression of the primary pacemaker, leading to atrial or A–V nodal escape beats. We wish to draw attention here to three distinct types of "junctional rhythm" which we believe to be more often observed than classified.

**Isorhythmic dissociation.** In this type of A–V nodal dissociation, two pacemakers (frequently the sinus and A–V nodes) fortuitously discharge at the same or a nearly similar rate, without antegrade or retrograde conduction across the A–V node. Electrocardiographically, the dissociated and upright P-wave approaches the QRS complex, disappears within it for several beats, then reappears and recedes from the QRS (fig. 1A). The sequence may be repeated. If the P-waves progress beyond the QRS complex, they remain upright (fig. 1B).

Although the term A–V dissociation implies independence between atria and ventricles, this is not absolute. Two tissues with intrinsic rhythm can beat at the same rate even though they may lack anatomical continuity (Marriott, 1957). Such "synchronized dissociation" has been described clinically in

**Wandering pacemaker.** Here there is suppression of one pacemaker, usually the sinus node, while atrial or A–V nodal

![Fig. 1. Isorhythmic dissociation. A: The dissociated P-waves remain within the QRS for several minutes (strip not shown), then reappear and recede from the QRS complex. The ECG also shows intermittent electrical alternans. B: The dissociated P-waves progress beyond the QRS complex, retaining their upright configuration.](https://academic.oup.com/bja/article-abstract/56/8/924/241516)

![Fig. 2. Isorhythmic dissociation: haemodynamic alterations. A: ECG showing isorhythmic dissociation. B: Panel showing ECG, central venous pressure and radial artery waveforms recorded sequentially in rapid sequence. The dissociated P-wave occurs before the QRS complex. C: Panel showing ECG, central venous pressure and radial artery waveforms recorded sequentially. The dissociated P-wave is within the QRS complex. The absence of atrial transport function has caused a reduction in the amplitude of the radial artery waveform, and the appearance of a different central venous pressure pattern. D: Central venous pressure recording showing transition of wave pattern when the P-wave, buried within the QRS (first two complexes), reappears and recedes from the QRS. Simultaneous ECG rhythm observed on the oscilloscope was not recorded.](https://academic.oup.com/bja/article-abstract/56/8/924/241516)
escape beats from different foci usurp the pacing function. The resulting interaction of sinus and escape impulses may lead to atrial fusion complexes. Electrocardiographically, the characteristic feature is a changing contour of the P-waves, associated with alterations in cycle length and PR interval (fig. 3A). The nature of the rhythm is confirmed by changes in P-wave shape in late beats, differentiating the condition from multifocal atrial extrasystoles where P-waves of different form and bizarre configuration occur in early (premature) beats. Sinus arrhythmia, which is not associated with atrial or A-V nodal escape rhythm, may also exhibit slight changes in P-wave configuration (Schamroth, 1971).

It is our impression that, in contrast to isorhythmic dissociation, a wandering pacemaker is infrequent during inhalation anaesthesia.

A-V nodal rhythm. This occurs, as is well-known, when the sinus node is suppressed, and the A-V junction acts as the pacemaker with its own intrinsic rhythm (35–60 beat min⁻¹). The P-waves are commonly absent, but may be inverted with a shorter than normal P-R interval, and may precede or follow the QRS complex (fig. 3B, C). In the latter situation the P-wave is inverted, in contrast to the pattern of isorhythmic dissociation, where a P-wave following a QRS complex remains upright (fig. 1B).

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REFERENCES


THE PRE-ANAESTHESIA FASTING PERIOD
Sir,—I was delighted by the article from Miller, Wishart and Nimmo (1983) calling into question the traditional insistence upon a 4-h period of abstinence from oral intake as a preliminary to anaesthesia for elective surgery. As I pointed out some time ago (Crawford, 1982), there appears to be no supportive evidence for the rationale of the 4-h—in some departments the 6-h—“rule”. My own previous tentative opinion that it requires re-evaluation has hardened considerably, hence my pleasure in reading the paper from Miller and colleagues.

However, I believe that they have been unnecessarily timorous by specifically excluding pregnant patients from the dietary management which they advocate. In statistical terms it is possible that gastric emptying is significantly delayed as an attribute of pregnancy; in clinical terms the difference between pregnant and non-pregnant, all other things being equal, matters little, if at all. The only prominent factors which are likely to delay gastric emptying during labour are severe pain, narcotic analgesics and maternal exhaustion (the latter being almost synonymous with “prolonged labour”). In a doubtless long-forgotten study (Crawford, 1956) I reported that the time taken for a barium meal to be cleared from the stomach (a form of investigation which is unlikely to be repeated!) in labouring mothers was not notably different from that typical of the healthy non-pregnant subject. My recollection is that the mothers who contributed to that investigation were not excessively fatigued, and had not received pethidine.

At the time I introduced an “advocated dietary regimen in labour” (Crawford, 1956), the outstanding cause of maternal death associated with anaesthesia was asphyxia caused by obstruction of the respiratory tract by semi-digested lumps of food. In those days cricoid pressure had not been publicized, and endotracheal intubation was by no means the invariable component of the technique of general anaesthesia in obstetrics.

It is my opinion that, in recent years, we have swung too far to the other extreme—an error for which I accept my own share of the responsibility. As Miller, Wishart and Nimmo suggest, it is ridiculous that patients be starved for up to 15 h before operation—that is no way to enter upon a demanding exercise. I greatly dislike starting upon a day’s work without my breakfast, and patients scheduled to undergo a morning-timed operation are in a precisely similar state. There is no justification for denying a light breakfast to a mother who is to be delivered on that morning by elective section; and certainly none if the operation is to be conducted under extradural blockade when, in our experience certainly, the operation rarely starts before 11 a.m.

Similarly, in regard to women in labour: many of them do feel hungry, and they should not be denied a “snack”, unless there is compelling reason to believe that the sudden requirement for administration of general anaesthesia is a likely proposition. Mothers who have received narcotic analgesia, or who are becoming exhausted by pain or protracted labour, are unlikely to want to have anything to eat. Those who are peacefully enjoying labour under extradural blockade might well do so. Most of what they accept under that circumstance—tea, toast, clear soup, jelly...