
Surgical Pitfalls, their Consequences, Transient Complications

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ABSTRACT: The methodology of this paper is based entirely on the experiential backgrounds of the authors. It outlines those factors which have become recognized as potentially important issues to patients who are considering recommendations of surgical treatment for their intractable epilepsy. Thus, on the one hand, it includes the important generic aspects of Informed Consent, while on the other hand there must be a very comprehensive and, when the operation is to be carried out under local anesthesia, a very detailed explanation of the preparation and the sequential steps in the surgical procedure. This should also entail a brief description of the roles of the various "team" members during the operative procedure. There are well-recognized complications associated with the various surgical procedures for the treatment of epilepsy. Further, there are predictable deficits following some of these procedures, some of which might be permanent and some of which may be transient. These pitfalls are briefly discussed.

RÉSUMÉ: Les écueils, les conséquences, les complications transitoires de la chirurgie. La préparation mentale: La méthodologie de cet article est basée entièrement sur l'expérience des auteurs et expose les facteurs qui sont maintenant reconnus comme potentiellement importants pour les patients à qui on a recommandé un traitement chirurgical de leur épilepsie réfractaire au traitement. D'une part, ceci inclut les aspects génériques importants du consentement éclairé et d'autre part, l'explication très exhaustive et, quand l'intervention doit être faite sous anesthésie locale, l'explication détaillée de la préparation et des étapes de l'intervention chirurgicale, ainsi qu'une brève description des rôles des différents membres de l'équipe pendant l'intervention. Les écueils: il existe des complications bien connues associées à différentes procédures chirurgicales dans le traitement de l'épilepsie. De plus, il y a des déficits prévisibles permanents ou transitoires associés à certaines de ces procédures. Ces aspects sont discutés brièvement.

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In spite of being lengthy operations, cortical resections for intractable seizures have a low rate of mortality and morbidity. Rasmussen, in a review of his large series of 760 operations for nontumoral epileptogenic lesions, cites a mortality of 0.39%. There was no mortality in the 700 temporal lobectomy (aTLY) group.¹

The pitfalls of aTLY (subpial, en bloc resection) or amygdalohippocampectomy can be divided into two categories: a) those related directly to the surgical act itself and b) those which can be classified as a predictable deficit after excision of eloquent functional structure.

PITFALLS DIRECTLY RELATED TO THE SURGERY

Hemiplegia

It is important to remind ourselves that "seizure surgery" is not a lifesaving procedure but one which aims at improving quality for a long life. Thus, the minutiae of the surgical act

have to be kept in focus. No cortical injury should occur by retraction, etc.

A major complication which can occur during temporal lobectomy is what was initially named "manipulation hemiplegia".² The hemiparesis can be quite variable in its severity and permanence and, in the dominant hemisphere, may be accompanied by dysphasia. This complication was originally thought to be the result of traction on the middle cerebral artery and its branches, leading to ischemia in the territory of irrigation through spasm or thrombosis. Recently it was suggested that perhaps the choroidal artery is more prone to injury than the

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middle cerebral artery because of its vulnerable anatomical location during mesial temporal lobe manipulation.^{3,4} This major complication should be rarely seen if the surgeon has an intimate knowledge of the surgical anatomy of the infero-mesial temporal lobe and appreciates the importance of avoiding either traction on the baso-mesial vasculature and/or attempting removal of unnecessary insular cortex.

Hemianopia

Hemianopia due to posterior temporal resection can be partial or complete. This complication increases in frequency as the posterior line of the excision is extended posteriorly.⁵ A 6 cm resection from the temporal pole may produce an upper quadrantic defect, while an 8 cm removal may produce a complete hemianopia. This complication can be avoided by not opening into the ventricle for more than 1 or 2 cm back from the tip of the temporal horn and preserving the white matter superior and postero-lateral to it.

PREDICTED DEFICITS FOLLOWING ATLY

Memory

Selected memory deficits are often seen in temporal epilepsy – verbal in the dominant hemisphere and visuo-spatial in the nondominant hemisphere. These selective deficits are usually aggravated by temporal lobectomy. Severe global amnesia may occasionally be seen following aTLY but is now vanishingly rare with preoperative neuropsychological evidence of normal contralateral hippocampal function. In extensive dominant aTLYs, significant verbal memory disturbances can occur.

Contralateral upper quadrantanopia

As already indicated, a contralateral upper quadrantanopia is an expected, and predictable consequence of a moderate sized temporal lobectomy, i.e. when the resection exceeds 5-5.5 cm behind the tip of the temporal pole.⁵ This is not considered a “significant” deficit, in that it rarely interferes with normal daily function. The authors have encountered only four patients in whom this deficit was of some consequence. Interestingly, two were electricians who worked in basements during the construction of large projects (business buildings) and the other two were tennis players who had difficulty on occasion finding the ball high in the air, i.e. in the blind quadrant.

TRANSIENT (MINOR) POSTOPERATIVE DEFICITS

Deficits

Hemiparesis

Hemiparesis may very occasionally occur following an aTLY. Whether this is due to retraction on the insula, the middle cerebral vessels, or other structures, is really not known in many cases.

Dysphasia

Dysphasia may occur postoperatively. Possible reasons have included: i) excessive traction on the posterior resection line (which should be avoided in the typical removal of the temporal lobe); ii) speech area located more anteriorly than normal; iii) speech area within a resected sulcus, the overlying stimulation of which failed to produce dysphasia.

Oculomotor paresis

Occasionally an oculomotor nerve paresis may occur, presumably from massage of the nerve with a sucker, forceps, or absorbent cotton.

Clinical course of a postoperative deficit

The typical transient neurological deficit appears within 12-24 hours, rises to a peak within 2-3 days and then gradually recovers over the course of a week to ten days. The closer the resection is carried out to the eloquent area, the earlier will be the onset of the deficit, the steeper will be the rate of onset of the deficit, and the longer will be the time period required for its disappearance.

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