INTRODUCTION

Corpus callosotomy has become a widely accepted surgical alternative for patients with intractable epilepsy who are unsuitable for focal cortical resection. Although most beneficiaries of this surgery have been, and still are, adults the procedure has
gradually found its place in the treatment of severe, medically refractory epilepsy in children. Since the young brain presumably differs from the adult brain with respect to its adaptive capacities, the medical, neuropsychological and behavioral consequences of the surgery in children may not be the same as those seen in adult patients.

The main objective of callosotomy is to eliminate or reduce generalized seizures, thereby improving the patients’ social adaptability and quality of life. However, there is as yet little consensus among centers with regard to patient selection. Some think that the surgery is overused;7 others feel that it is underutilized22 in children. On the clinical level, there is reasonable agreement about the efficacy of corpus callosotomy in a subset of patients with unilateral lesions and major motor seizures or drop attacks.11,22,23,30 On the other hand, several studies, including our own, have shown that children with multiple foci and diffuse brain disease may also benefit from the procedure.13,20,22,29,30 Opinions also differ among centers regarding the kind of outcome that constitutes worthwhile improvement compared to the patient’s current life situation. Unlike focal resection, callosotomy rarely renders the patient seizure-free, and outcome may not match expectations. Furthermore, evidence from patients having undergone temporal lobectomy suggests that freedom from seizures does not necessarily translate into a better quality of life.4 For the same reason, several centers have chosen to exclude patients with severe mental retardation from the surgery,12 even though many of these patients respond well.8,13,20,23

Comparisons of outcome in children are difficult for various reasons. Most studies have reported isolated cases or data from mixed samples (mostly adults). Furthermore, there are considerable differences between institutions with regard to the extent of the callosal section and the surgical procedure performed. In addition, the length of the follow-up varies among the cases reported in the literature. As Campbell7 pointed out, the time elapsed since the surgery is a critical factor in the assessment of the outcome in view of the fact that there is considerable fluctuation of the seizures in individuals with intractable epilepsy. Moreover, it is not known whether or not the plasticity of the immature brain may work to the disadvantage of the patients by providing new pathways for the spreading of epileptic activity.

Finally, there is a paucity of studies that have addressed neuropsychological, behavioral and quality of life issues in the evaluation of the outcome of callosotomy in children. Most of the attention has focused on clinical outcome. A review by Nordgren22 of the outcome in children aged 16 years and younger, reported by different centers, has demonstrated that the majority of the children had a greater than 80% reduction in their seizures with improvements of all seizure types. When cognitive or behavior changes were reported, these were generally considered to be an improvement with respect to the patients’ preoperative level of functioning. The few exceptions (two cases in 50) that developed problems with speech and verbal memory were those with left hemisphere lesions in whom atypical speech representation was suspected. Recent studies of children and young adults operated at various centers in Australia23 and Brazil8 have yielded similar results.

Starting in 1978, the Department of Neurosurgery at the Hôpital Sainte-Justine in Montreal was among the first in North America to perform corpus callosotomy in a larger, predominantly pediatric patient population.13,14,15 Over the past two decades, our team has concerned itself with the study of the long-term neuropsychological sequelae of the procedure in these children, both in terms of its effect on cognition and behavior.20,27 and in terms of the potential compensation that may take place following hemispheric disconnection.18,19,21 Emphasis has also been placed on the social adjustment and