

# Psychomotor Epilepsy and Aggressive Behavior

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The literature states that patients with psychomotor epilepsy are prone to aggressive acting-out behavior. Of 150 epileptic patients whose seizures were photographed, 42 had ictal psychomotor automatisms and 15 had postictal psychomotor attacks. There was no instance of ictal or postictal aggression in this study. When there was danger of aggressive behavior, it could promptly be averted by abandoning restraint efforts.

To define the characteristics of the aggression prone individual, 700 charts were reviewed; 34 patients were found who had committed aggressive acts. The profile of the aggression-prone individual which emerged was that of a young man of lower-than-average intelligence with a history of behavioral difficulties dating back to school age and who did not have strong religious ties. Presence or absence of psychomotor epilepsy was not a relevant variable.

It is a commonly held opinion that patients suffering from psychomotor seizures are prone to perform aggressive, antisocial acts, either as part of their seizure or in the immediate postictal state. A major textbook of neurology states that during the attack, the patient is "likely to walk about, unbutton his clothes, expose himself, urinate, or commit acts of violence."<sup>1</sup> A major textbook of psychiatry tells its readers that "acts of violence may be committed in these automatisms and may be of a strikingly brutal nature, the patient pursuing his crime to a most revolting extreme."<sup>2</sup>

It is also well known that a diagnosis of psychomotor epilepsy was used by the defense in Jack Ruby's trial.<sup>3</sup> The terms "psychomotor epilepsy" and "psychomotor variant epilepsy" were used synonymously by various expert witnesses during this trial in spite of the fact that psychomotor variant refers to an electroencephalographic pattern rather than a clinical condition.<sup>4</sup>

Mark and Ervin have recently devoted a book to this problem, *Violence and the Brain*,<sup>5</sup> and have strongly suggested that rage attacks frequently occur in patients with psychomotor seizures and that these are amenable to sur-

gical destruction of certain areas of the limbic system. One of the cases presented in their book has now become the model for Crichton's science fiction novel *The Terminal Man*,<sup>6</sup> which contains too much scientific information to be regarded as purely fiction. It also reiterates to a vast audience of the general public that psychomotor epilepsy is one proven cause of violence and implies that a patient with this disorder is likely to go into murderous rages at a moment's notice.

Inasmuch as this impression did not correspond with our clinical experience over the past 14 years at the Lafayette Clinic and Epilepsy Center of Michigan, Detroit, during which time I had the opportunity to examine several hundred patients with psychomotor seizures, two studies were undertaken: one dealing with the examination of seizure photographs obtained during psychomotor seizures; the other involving an attempt to define the aggression-prone individual in a sample of patients who either had or were suspected of having epilepsy.

## Study 1

During the years 1959 through 1964, most epileptic patients admitted to the Lafayette Clinic had a seizure induced in the electroencephalogram laboratory by means of bemegride as part of the routine work-up. The seizure was recorded electroencephalographically and the behavior of the patient was photographed with a camera that advances the film automatically after each exposure. Of 150 patients whose photographs were of a satisfactory nature, 42 had psychomotor automatisms as ictal events, and 15 had psychomotor seizures postictally after an abortive or generalized seizure.

All the pictures were taken by myself at a distance of not more than six feet from the patient and there was no incident of aggressive behavior during or after the seizure. As a result of the seizure, patients frequently removed their EEG recording electrodes, but these could be re-applied by the technician within two to three minutes after the attack for obtaining a postictal record. At no time was any aggressive activity directed against the technician by the patient.

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In contrast to the bizarre and dramatic descriptions given in the literature of the behavior of a patient during a psychomotor seizure, the activities of the patients as documented by the photographs consisted mainly of the following features: chewing, smacking or swallowing motions; repetitive fussing type of behavior with nearby objects (like the pillow which was used to support the patient's arm for injection); taking off the electrodes and examining them in a bewildered, confused manner; leaving the chair and wandering around the room. Disrobing or exposing of the genitals did not occur. In one instance, a patient opened all of his shirt buttons but he did not re-

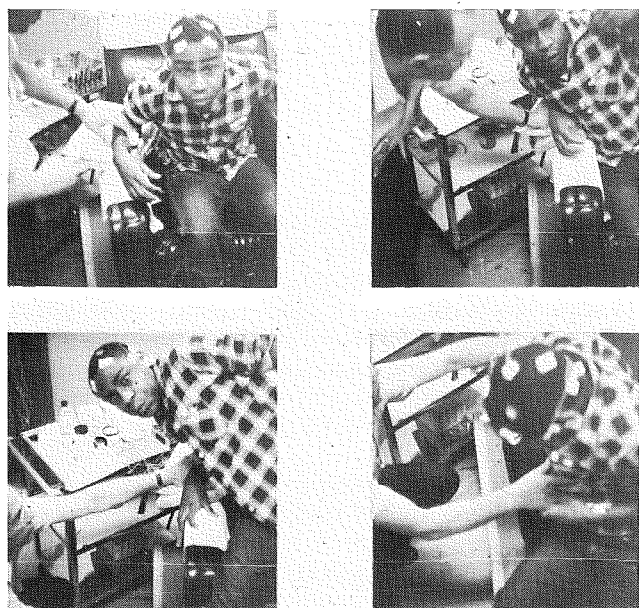
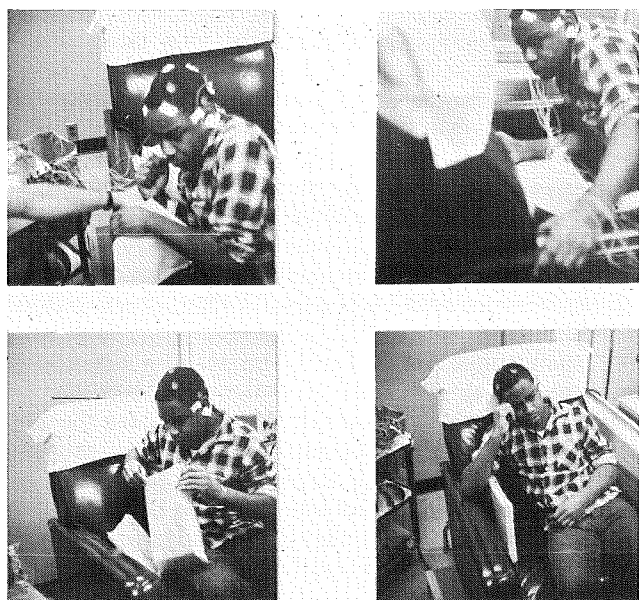


Fig 1.—Psychomotor automatism; patient with angry, bewildered facial expression, lunges forward, resisting attempts at restraint.

Fig 2.—Psychomotor automatism; violence seems imminent but is averted by removing restraints. Patient shows "fussing type" automatic behavior.



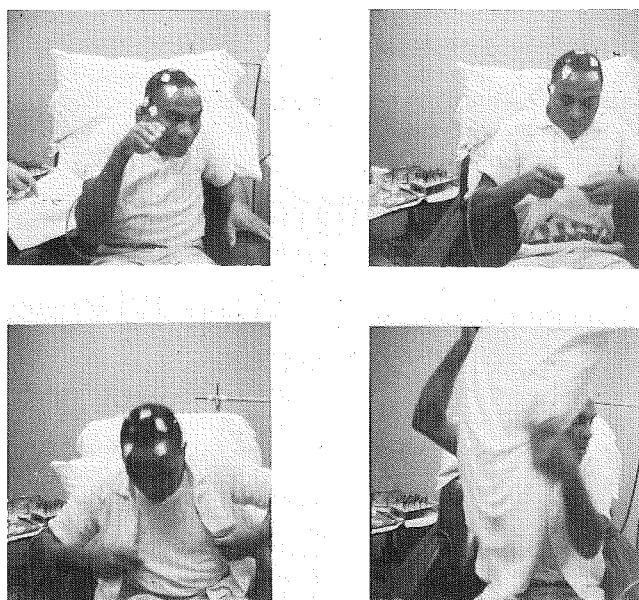
move his shirt and he did not open the zipper of his trousers. On two occasions, patients suddenly lunged forward, leaving the chair and showing a rather ferocious facial expression. Although these patients did have a history of aggressive acting-out, no attacks occurred during their seizures in the hospital.

Figures 1 and 2 show one of these patients and exemplify a psychomotor seizure which could have led to violence. The patient suddenly lunged forward, having a bewildered and angry facial expression. An unsuccessful attempt to keep him in the chair by the attending physician resulted in making the patient angrier. The first picture in Fig 2 shows the clenched right fist, a boxer-type stance, and violence seems imminent. As soon as the patient was released, however, he merely got out of the chair, then sat down again and began typical fussing-type behavior with the pillow, eventually ending up in a somewhat gloomy, drowsy mood. This was the only patient in the entire series in whom there actually was incipient aggression. His act represented, however, a defensive reaction due to being restrained rather than active trouble-seeking.

Figures 3 and 4 show our most pronounced example of "disrobing." In Fig 3, the patient lunged forward but did not leave the chair. He then began to unbutton his shirt, which he succeeded in doing but, instead of taking it off, he proceeded to fussing with the pillow. In Fig 4 there was more fussing with the towel on the chair. He then examined the puncture wound resulting from the bemegride injection in a bewildered fashion and apparently also wondered why there was blood on his shirt. There was no disrobing and no genital exposure.

Figures 5 and 6 show the evolution of another typical psychomotor automatism. The facial expression showed inner laughter coupled with intermittent bewilderment. The patient initially fussed with the pillow, then examined a recording electrode which he had removed from his

Fig 3.—Psychomotor automatism; patient begins to lunge forward, then unbuttons his shirt. No further disrobing, instead, fussing with a pillow.



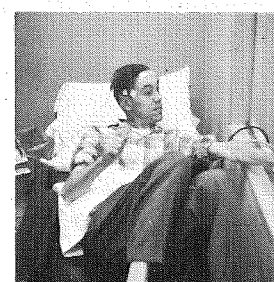
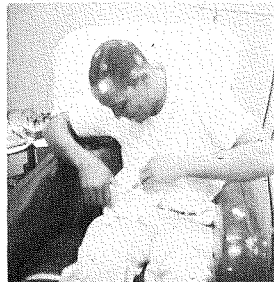
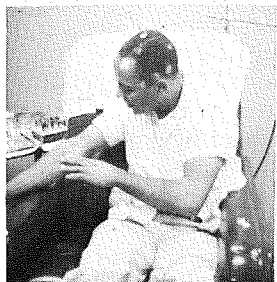
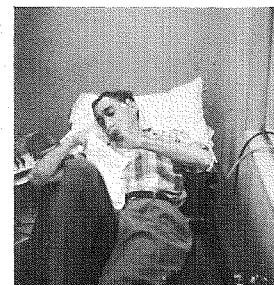
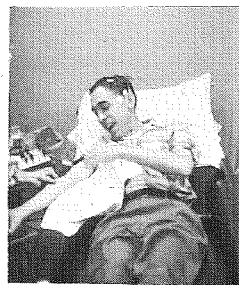
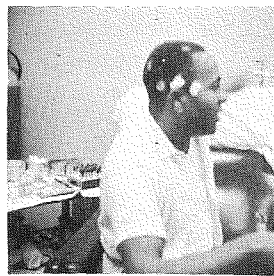
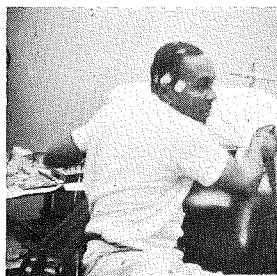


Fig 4.—Psychomotor automatism; there is some fussing with towel on chair, bewildered examination of needle puncture, as well as blood stain on shirt.

Fig 5.—Psychomotor automatism; facial expression of bewildered amusement and some confused examination of EEG recording electrode which had been removed by the patient.

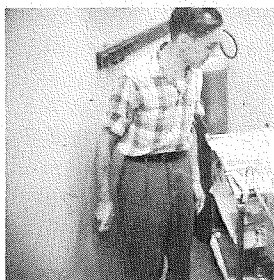
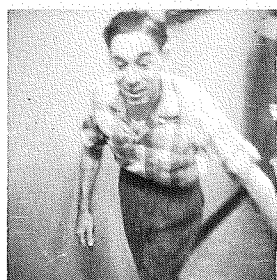
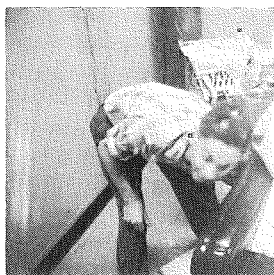
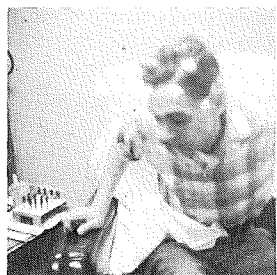


Fig 6.—Psychomotor automatism; patient leaves chair, wanders around the room, fusses with furniture, then ends up staring confusedly at glassware, no attempt is made to destroy objects.

head. In Fig 6 he had left the chair and momentarily fussed with it. He then rapidly walked to the door and, on finding it locked, returned to the center of the room staring with confused curiosity at the glassware on the portable stand. There was no attempt made by the patient to upset the furniture or destroy objects.

Apart from the induced seizures, I have seen several hundred spontaneous psychomotor seizures on the neurology ward of the Lafayette Clinic which were quite similar to the drug-induced ones. At no time has a member of the nursing staff or another patient been hurt by a patient as a result of a seizure. In one instance an adolescent patient with psychomotor seizures picked up a chair and hit another particularly obnoxious patient over the head with it, then calmly sat down again. When asked why he had done this, he merely replied, "God told me so." The act was monosymptomatic, goal directed, not accompanied by confusion, and not part of a psychomotor seizure. It was merely an expression of vengeance.

## Study 2

To delineate the factors underlying aggressive acting-out in certain individuals, a second study was undertaken: the case material of patients seen at the Epilepsy Center of Michigan during the past five years was reviewed. The clinical and electroencephalographic information is carefully coded on all patients at the time of initial evaluation on forms that allow computer processing of the data. Out of 700 patients, 34 (4.8%) were found in whom the variable "destructive-assaultive" behavior had been coded as present.

The rather small percentage was a surprise and, even if the examining physician had omitted coding the particular variable in some instances and one would arbitrarily double the number, it would still be quite low. From the experience with inpatients at the Lafayette Clinic, 5% to

Table 1.—Primary Diagnoses

Diagnosis	Patient Group	
	Aggressive	Nonaggressive
Epilepsy	17	21
Epilepsy suspected	7	6
Psychiatric disorder	6	4
Mental retardation	4	3

Table 2.—General Description of Patient Sample		
Descriptive Data	Patient Group	
	Aggressive	Nonaggressive
Mean age	15.7	16.1
Sex		
Male	29	29
Female	5	5
IQ	83.5	85.8

Table 3.—Significant Differences Between Aggressive and Nonaggressive Patients			
Data for Aggressive Patients	No. Subjects	F Value	P Value
More behavioral difficulties in school	66	16.2	<.001
More immaturity on psychiatric evaluations	62	14.3	<.001
More frequently running away from home	62	8.8	<.01
Less time employed in past three yr	15	7.8	=.01
More frequently truant from school	59	6.8	<.05
Less commonly Roman Catholic	60	6.6	<.05
More frequently psychotic tendencies on psychological tests	67	6.4	<.05
Affect more commonly somewhat decreased	67	5.6	<.05
Less frequent church attendance	44	5.1	<.05
More commonly organic cerebral disease evident on neurological examination	53	4.7	<.05

10% appears to be reasonable: out of 20 patients, we tend to have one or two physically aggressive patients on the ward most of the time. It was found that the majority of these 34 patients were young men with lower-than-average IQs. These patients were then matched for age, sex, and IQ with another group of 34 patients who had not displayed aggressive outburst. The final diagnoses, age, sex, and IQ of the patients in both groups are shown in Tables 1 and 2.

The groups were then compared on 550 variables which included history, neurological examination, psychiatric evaluation, some psychological tests, and EEG. When those variables which were inadequately represented in the sample (eg, manual rotation during birth, sleep disturbances in infancy, etc) were eliminated, 180 remained on which F tests were performed. None of the EEG variables differed significantly between the groups and presence or absence of psychomotor seizures likewise made no difference.

Psychomotor seizures were present in four patients of the aggressive group and in two patients of the nonaggressive group. An EEG temporal epileptogenic focus was found in three patients of the aggressive group and in two of the nonaggressive group. These differences are not statistically significant. The aggressive individuals had more overall behavioral disturbances going back to childhood, signs indicating diffuse organic disease; as an unexpected

sidelight, it was found that they were less religious (Table 3).

### Comment

The observation as to the lack of ictal aggression in psychomotor epilepsy patients is fully supported by experience at the Montreal Neurological Institute, where the largest number of temporal lobectomies have been performed on this continent. Gloor<sup>7</sup> stated that they had not observed a single incident of ictal aggression at that institution, either spontaneously or as a result of electrical stimulation of temporal lobe structures. Although some psychomotor epilepsy patients do have rage attacks, the relationship between aggression and seizures is not a direct one, as Mark and Ervin have pointed out.<sup>8</sup> Some of their patients were improved in regard to aggressive behavior as a result of stereotactic amygdalotomy, but continued to have psychomotor seizures.

The lack of relationship between frequency of temporal lobe attacks, grand mal attacks, and the likelihood of rage outbursts in children was also noted in a study by Ounsted.<sup>8</sup> Furthermore, it was observed in that study that a subgroup of children who had only psychomotor attacks without other forms of seizures, like grand mal for instance, were "uniformly intelligent and conforming children and none of them had rage outbursts at any time."

The data presented here indicate that the psychomotor seizure, as a general rule, is not associated with aggressive or destructive behavior on the part of the patient. It is conceivable that the patient, if he were to be restrained during his confusional state, might react in a defensive manner that could be misinterpreted as a goal-directed assault. This is not likely to occur if the patient is left to his own devices during the seizure and is merely prevented from wandering off by locking the door and staying with him, but not engaging in physical contact.

There is adequate physiological evidence that limbic-system structures are involved in the elaboration of aggressive behavior in animals<sup>9</sup> and there is little reason to suspect that this should be different in humans. There is also good evidence indicating that psychomotor seizures originate from sites within the limbic system, but there is no evidence that the mechanisms underlying psychomotor seizures and aggressive acting-out are identical. On the contrary, it appears that these different forms of behavior have different neurophysiological substrates.

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