A SIMPLE CASSETTE CHANGER FOR CEREBRAL ANGIOGRAPHY

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Cerebral angiography has gone through several stages of development since its introduction in the late 1920's. At first great difficulty was encountered in the development of a contrast material suitable for injection into the cerebral circulation. Difficulties were also encountered in developing proper methods of injection into the carotid system. The problem of securing films of good radiological quality of a correctly positioned head has at times been almost overwhelming. These difficulties were magnified by the surgical drapes necessary for open arteriography. With the more recent development of techniques of percutaneous arteriography using relatively nontoxic injection materials, the procedure has become of more practical value. However, it was apparent early that a series of films was better than a single film and a large number of very complicated pieces of apparatus have been developed to achieve this end. It seems obvious, however, that the ideal apparatus has not yet been built. Most of the apparatus thus far have been cumbersome, expensive and not always reliable.

In 1952, an attempt was made to design a device to hold standard roentgen-ray cassettes for a lateral exposure of the skull during angiography. We were able to build a simple apparatus of plastic materials. Shortly thereafter, a similar model of wood was constructed in a home workshop, using materials costing less than ten dollars (Fig. 1). This same model has been used in the Department of Radiology at Passavant Memorial Hospital for a total of several hundred arteriograms with no problems of maintenance or mechanical failure. Structurally similar models have also been in use in several other hospitals. With either of these models, it has been possible to take a series of three 10×12 inch lateral films of the skull as rapidly as the film cassettes can be removed, possibly in as little as 5 seconds or at any other time intervals desired. With slight alterations it would be possible to take a similar number of films in the anteroposterior projection.

The apparatus consists of a "L"-shaped frame with films for the lateral view being held in the vertical portion. A series of lead-backed cassettes are used and these are pushed against a Lysholm grid by a spring-backed pressure plate. After the first exposure the cassette is pulled from the apparatus by a tab of adhesive tape previously fixed to its side. The next cassette is then automatically pushed into position. Only the first and second cassettes need be lead-backed. In actual practice, a preliminary film of the skull is taken before any injection is made to check the function of the roentgen-ray apparatus and position of the head as well as to spot any foreign objects, such as hair pins. The successful use of this apparatus requires some team work between the surgeon and the roentgenologist as to the timing of the injection in relation to the roentgen-ray exposures and there must be synchroniza-
tion of action between the technician who controls the roentgenological unit and whoever may be removing the cassettes. The anteroposterior films may be taken using either the Potter-Bucky apparatus beneath the roentgen-ray table or by the use of grid cassettes beneath the patient's head. The use of this apparatus makes it possible to obtain three good straight lateral films with a minimum amount of effort. The whole series of films are quickly available. There is no necessity for a wait of 30 minutes or more as with some types of apparatus using roll film.

In the construction of this apparatus some experimentation may be necessary to achieve proper spring tension behind the pressure plate and some tailoring-to-fit will be necessary to achieve smooth motion of the cassettes. Exact dimensions are not given since these depend upon the size of the cassettes used. However, once the proper fit is obtained, the apparatus has been found to function well without alterations.

A greater number of films taken in shorter periods of time may well be desirable but it is our belief that this apparatus functions better than do other devices costing many times more. It has served well as a stop-gap until the development of a reliable reasonably simple seriagraph.