



F45 Method Comparison for Jaw Resection

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The goal of this presentation is to present results of an assessment of jaw resection techniques using traditional and new tools.

This presentation will impact the forensic science community in the description of a new and efficient technique using a readily available instrument.

Circumstances often arise in victim identification when a person must be identified based on dental evidence. This is especially true in Mass Fatality Incidents (MFI) such as the World Trade Center and Hurricane Katrina. In these cases access to the dentition becomes of the utmost importance for visualization and charting of the victim's dental characteristics, and photography and acquisition of diagnostic postmortem radiographs for comparison to antemortem records. Jaw resection may be necessary in these conditions for complete examination of the dentition. The consideration for resection may also occur in burn victims when viewing of the body is not an option. Recognizing the potential loss of anatomical characteristics valuable to the physical anthropologist, it has been stated that the careful removal of the jaws should be standard procedure in any case of resection. Consent of the medical examiner or coroner or the written consent of the next of kin is required for resection. Failure to acquire these permissions is considered desecration which carries penalties in all states.

When jaw resection for dental identification purposes is indicated and permitted, the forensic odontologist has a range of techniques by which to accomplish this task.

Common methods and instruments for resection have been described in the literature including the use of bone saws, the Stryker saw, piano wire saw, garden loppers and mallet and chisel. For maxillary resection the operation can be described as a simple form of the LeFort type 1 osteotomy, in which the maxilla is resected maintaining intact root tips. For mandibular resection, it may be sufficient to only sever the ascending rami, giving care to avoid 3rd molars and to maintain a tissue bridge.

The advent of battery operated reciprocating saws offers the odontologist another option in the choice of instrumentation. The reciprocating saw allows for an efficient and accurate resection, and frees the upper and lower jaw segments with minimal time and tissue damage. These segments can then be repositioned and sutured back in place at completion of the dental autopsy. The use of a six-inch metal cutting blade enables the cut to be made in a single operation. Care must be taken to angulate the blade correctly. Cuts through the maxillary bone are made high on the malar processes and above the anterior nasal spine to avoid the apices of the maxillary teeth.

This study compared the traditional methods of resection using garden loppers and a Stryker saw, with the use of a reciprocating saw in human cadavers. In this study, it was determined that a technique involving only three cuts was sufficient to complete the entire operation with the reciprocating saw. First, a horseshoe-shaped incision is made below the mandibular base to free the submandibular soft tissue. Then a single cut is made across the ascending rami. Lastly the angulated cut is made through the maxillary bone. The sequence of these cuts is important as it is more difficult to obtain clean separation if the order is reversed.

While comparable in time to an experienced operator using the garden lopper method, resection with the reciprocating saw produced a superior clean cut, allowing possible replacement of the jaws should further anthropological measurements be desired. The Stryker saw method was a distant third. The short blade length of the Stryker saw required an additional step of separation of the distal portions of the maxillary bone with tools such as bone chisels.

Equipment is available that is compatible with other instruments in the operating area such as portable X-ray units and flashlights. The batteries powering these devices are interchangeable, allowing efficiency in inventory and instrumentation. The result of this project will be recommendation of a jaw resection technique that can be used in Mass Fatality Incidents or any situation when a victim must be identified on dental evidence and when access to the dentition is restricted. Practical information obtained from the described research project results in recommendations for forensic odontologists and medical examiners in selection of equipment and technique for oral autopsy use.

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