



## Rodent Surgery: A Safer Restraining Method

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Received: September 01, 2012  
Accepted: October 02, 2012  
Arch Clin Exp Surg 2013;2:210-211  
DOI:10.5455/aces.20121002203336

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Dear Sir,

We are presenting a method of restraining laboratory rodents for surgical procedures involving the thoracic or abdominal cavity (in our laboratory heart, kidney and liver transplants).

Characteristics of a good method of fixation of the animal on the operating table are minimal discomfort and quick application (since gaseous anesthesia is used), with all the implements situated away from the operating field. Ideally, a single operator should be able to perform the procedure comfortably and safely.

Although simple, procedures such as injections and fluid collections benefit from adequate restraining methods [1-3]; with longer surgical procedures, there is certainly scope for improvement in the immobilization of rodents.

The texts describing experimental surgery procedures suggest the use of rubber bands fastened around the paws of the animal. Even the dedicated rat operating tables use circular restraints made of various materials or spring-loaded paw clamps [4-6]. The major drawback of these systems is that they can impair the circulation into the extremities, causing ischaemic changes and the possibility of inflicting unnecessary postoperative discomfort to the animal. Furthermore, most of these also need an assistant for their proper application.

In our laboratory, we use a simple system consisting of pins and medical tape. Four lengths of tape (10cm each) and four pins are prepared during induction of anesthesia in a bell jar.

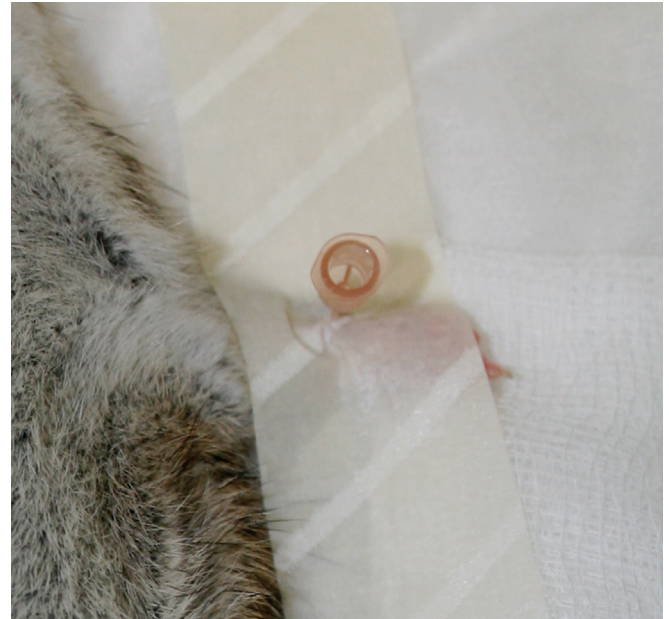
Once the rodent is unresponsive, it is moved to the operating table and placed



**Figure 1.** Rodent anaesthetized and restrained using our suggested system of tape and pin.

in a supine position, with the nose in the anesthetic mask. The rat can be easily controlled with one hand while the other places each piece of tape over a paw, securing it to the soft mat covering the operating table (Figure 1). Pins are then used to transfix the tape and the mat, very close to but not involving the animal's paws (Figure 2). The animal is thus fixed to the operating table.

This secure fixation can be maintained for any length of time, with no concern to the peripheral circulation. The only drawback of our system is that it requires a soft support (such as cork or wood) in order to allow pin fixation. Even so, it is suitable for most experimental surgery laboratories and microsurgical courses. We think this simple and cheap construction is a useful adjunct to the already described restraining techniques.



**Figure 2.** A close-up image demonstrating the pin going immediately beside the rodent's paw.

### Conflicts of Interest

The authors declare that they have no conflict of interest.

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