THE CONTRACTILITY OF THE CAUDA EPIDIDYIMIDIS OF THE MOUSE, ITS SPONTANEOUS ACTIVITY *IN VITRO* AND THE EFFECTS OF OXYTOCIN

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Muratori & Contro (1951) and Muratori (1953), using microcinematography and a Knisely Quartz rod apparatus for transillumination, recorded spontaneous peristaltic contractions and segmentation movements *in vivo* in the corpus epididymidis of the rat. Similar results were reported for the body and head of the epididymis in the rat and hamster by Risley & Turbyfill (1957).

In roller tube cultures, Battaglia (1958) recorded spontaneous movements in the caput, corpus and cauda epididymidis of the rat.

In the rabbit *in vivo* using an abdominal chamber technique, Cross (1955) observed peristaltic and pendular movements in the tubules of the caput and corpus epididymidis, and segmentation movements of the smaller tubules of the cauda. Oxytocin had no clear effect on epididymal motility.

Bielanski & Ewi (1964) recorded spontaneous contractions in the rabbit epididymis *in vitro*. Oxytocin reduced the frequency of the contractions.

Knight (1972) recorded the pressure in the ductus deferens of the ram *in vivo* and did not find spontaneous contractions of the epididymis. The intravenous injection of oxytocin elicited epididymal contractions.

In the present work, the contractility of the cauda epididymidis of the mouse was studied *in vitro*. Twenty-nine Rockland mice (25 to 30 g body weight) were killed by stunning and the cauda epididymidis was immediately removed and placed in a 4-ml thermostatic bath containing a modified Tyrode solution of pH 8.3 with the following composition per litre: 8.0 g NaCl; 0.2 g KCl; 0.1 g $\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$; 0.17 g CaCl_2 ; 0.055 g Na_2HPO_4 12 H_2O ; 1.0 g NaHCO_3 ; 1.0 g glucose.

Isometric recordings of tension developed in the cauda epididymidis were obtained with a Satham Strain Gauge 0.15 oz connected to a Hewlett Packard Preamplifier model 350-1100 with a power supply model 350-500B and a Recti Ritter recorder, Texas Inst. Inc., model PRRIMA 25. The baseline or resting tension was 50 mg.

The contractility of the cauda epididymidis was studied for an average time of 9 hr; contractions were evaluated by amplitude (in mg) and frequency (contractions/10 min).

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Table 1. Spontaneous activity of the cauda epididymidis of the mouse *in vitro*: effects of temperature on amplitude and frequency of the contractions

Temperature (°C)	Amplitude* (mg tension)	Frequency* (contraction/10 min)
37	3 (2.7 to 3.5)	25 (21 to 32)
32	2.5 (2.1 to 2.8)	18 (14 to 25)
26	2 (1.5 to 2.5)	13 (7 to 16)

* Average values and range.

TEXT FIG. 1. Spontaneous contractility of the cauda epididymidis of the mouse *in vitro* at 37° C; pH of saline = 8.3.

TEXT FIG. 2. Effects of oxytocin on the cauda epididymidis of the mouse *in vitro* in which spontaneous contractions were not present. Temperature of saline = 26° C; pH = 8.3.

Spontaneous contractions were recorded in twenty-four of the recordings. In all of them, the effect of temperature, pH and reduction of the solution's concentration were determined. In six of these experiments, oxytocin was added.

At 37° C, the average frequency was twenty-five contractions/10 min and the average amplitude was 3 mg. Average values were calculated from the data obtained in all the recordings. Lower bath temperatures caused reductions in the amplitude and frequency of the spontaneous contractions (see Table 1 and Text-fig. 1).

Changing the pH of the solution from 8.3 to 7.6 (8.0 g NaCl; 0.2 g KCl; 0.215 g MgCl₂·6H₂O; 0.2 g CaCl₂; 0.0575 g NaH₂PO₄; 1.0 g NaHCO₃; 1.0 g glucose/litre) did not apparently produce any alteration in the spontaneous motility, though the results were not subjected to statistical analysis.

A 10% reduction in the concentration of the bath solution caused a diminution in the intensity and/or the frequency of the spontaneous contractions in such a way that the product of both factors was 30% lower than in the original solution.

Oxytocin added to the solution at concentrations ranging from 125 to 1000 µU/ml, increased the intensity and frequency of contractions in the cauda. Once the effect was obtained, it was not altered by further increasing the concentration of the hormone. The effect disappeared after oxytocin was washed out.

In the five experiments in which spontaneous contractions were not present, contractions appeared after oxytocin was added to the bath and persisted even after oxytocin had been washed out (see Text-fig. 2).

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