

# Alleviation of a Gastrointestinal Tract Impaction in a Tortoise Using an Improvised Vibrating Massager

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## INTRODUCTION

In nature, some tortoises are known to engage in occasional ingestion of stones (lithophagy) and the (often incidentally with food) ingestion of soil (geophagy). This behavior is thought not to be a problem under natural conditions and may arise because of various reasons including calcium deficiency, parasite control (Jennemann 2010), digestive aid and “marker” droppings (Sokol, 1971; Murphy, 1973; Luckenbach, 1982; Obst, 1986). “Pathological lithophagy” is also reported in captive conditions where disease may result in substrate consumption and coprolith formation (Rhodin, 1974; McArthur *et al.*, 2004; Mader, 2006; Jennemann, 2010). Hunger has been implicated as a reason for this (Jennemann 2010), and anecdotal information suggests that dehydration may also sometimes be involved. In captivity, however, and in particular in vivariums, substrate ingestion is widely reported as a negative feature of environments where the substrate easily attaches to food or may itself become a target. Broadly, the term “pica” is used to describe the deliberate ingestion of nonfood items, and a general cause is thought to be under-stimulation (Frye, 2004). Pica-related coproliths and other obstructions should be considered serious and potentially fatal (Sokol, 1971; Luckenbach, 1982; Obst, 1986).

## CASE HISTORY

A marginated tortoise (*Testudo marginata*) was presented with acute onset of anorexia and lethargy. Clinical examination revealed bilateral forelimb flaccidity and head retraction deep within the shell margin. The animal was significantly unresponsive. Initial suspicion was that of possible neurological injury secondary to hyperthermia or food toxemia. Radiography showed a large partially disseminated mass of dense particulate opacities in the midabdomen (transverse colon, cecum, and distal small intestine) consistent with a coprolith derived from ingested substrate (Fig. 1). Dorsoventral and anteroposterior imaging showed the former of these aspects to be the most informative. Discomfort was presumed as the probable cause of the head retraction and lethargy.

The tortoise was immediately hospitalized, and analgesia was administered in the form of buprenorphine (Vetergesic, Alstoe Ltd., Yorkshire, England) at a dose of 0.01 mg/kg and given intramuscularly (IM). At approximately 40 min

postanalgesia, the tortoise protruded its head and commenced normal behavior and gait. The general characteristics of the animal were female (flat plastron and short tail); however, during handling the tortoise projected a penis. Thus, it is either an atypical male or intersexual. Various shell abnormalities were observed consistent with a captive-raised juvenile and imperfect husbandry.

Within 48 h of admittance, good appetite was noted for a diet of dandelions, clover, lettuce, and tomatoes fortified with a tortoise-specific vitamin mineral supplement Nutrobal (Vetark, Winchester, England) and daily baths in Repto-boost (Vetark). An available thermal gradient range of 23°C



**Figure 1.** Radiograph showing dense particulate material in the gastrointestinal tract.

(73.4°F) to 29°C (84.2°F) was present in the clinical quarters. Oral liquid paraffin (light mineral oil lubricant) was administered daily (5.0 mls) by stomach tube and (5.0 mls) per-cloaca. Fluid (sodium chloride 0.9%, number 1, total 20 mls subcutaneously into rear limb pockets) was administered on day 1.

On day 14, we attempted the arguably crude, although in our experience sometimes effective and anecdotally supported, method of placing the tortoise in a car and driving on poor roads for approximately 2 h on two consecutive days. However, the method was not noticeably productive on this occasion.

At 2 wk posthospitalization, the tortoise remained clinically normal, although no significant material had been passed from the gut. A subsequent radiograph showed the mass to have increased its consolidation in the cecal and transverse colon regions.

At 3 wk, modest vibrational massage was applied by attaching with tape (Durapore, 3M, St. Paul, MN) a small human “sexual aid” vibrator (Rocks-Off Ltd, Kettering, U.K.) to the plastron ventral to the mass (Fig. 2). The device was attached and activated for approximately 5 min twice daily. A towel was used as a temporary “substrate” during the procedure to absorb some of the vibration, which can otherwise be somewhat irritating for the animal if the unit is in contact with a hard cage floor.

Within four days of applying the improvised vibrating massager, significant material began to pass, and after 14 days of vibrator application, particulates had reduced in



**Figure 2.** Vibrating massager attached to plastron.



**Figure 3.** Radiograph at 8 weeks showing a reduction of the material in the gastrointestinal tract.

number from approximately 120 to 70. A follow-up radiograph showed the mass to be reduced, disintegrating, and transiting normally (Fig. 3). Figure 4 shows a small sample of the evacuated particulate material (gravel). Some of these particulates measured significantly greater than 1 cm (0.4 in) in diameter.

Vibration therapy was ceased after two months because little of the coprolith remained, and this appeared to be evacuating consistently. By 13 weeks, the entire mass was eliminated. Eight months after presentation, the tortoise remains in good health.

The owner had acquired the tortoise from a pet store in 2005 and housed the animal primarily in an indoor vivarium. Both the tortoise and its vivarium were purchased as part of a proprietary tortoise accommodation package. The facilities included a gravel substrate.

## DISCUSSION

The use of vibration massagers is not new in the alleviation of gut impactions in humans. However, we could find no specific reference to other case histories involving the use of this simple and low-cost method in the literature regarding tortoises. The vibrator we used was very minimally invasive in the tortoise's husbandry and well tolerated by the animal. It is possible that the release of this impaction is coincidental to the use of the vibrator and not causally related. It



**Figure 4.** Photograph of evacuated material (gravel/stones). The measurement is in centimeters.

remains unclear whether the vibrator produced ongoing impaction relief or was functionally limited to acute relief. Nevertheless, particle evacuation commenced promptly following use of the vibrator, and it is not unreasonable to presume that this method may have important properties for the noninvasive alleviation of resistant impactions in tortoises and some other animals.

Prevention of pica may not be simple because although plain substrates such as paper can be used they do not allow for natural digging and other behaviors. Also, although

more natural substrates such as a sand/soil mixture for Mediterranean tortoises offer some behavioral opportunities, these can be difficult to manage in small artificial conditions.

The “solution” is not always a “popular” one but involves the avoidance of vivariums wherever possible in favor of spacious, naturalistic environments that can probably only be achieved in specifically designed and managed “tortoise paddocks” and outside ranges. Accordingly, the use of vivariums (even those claimed to be “purpose-made”) should be discouraged.

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