

CASE STUDY No. 2: Man Bac Burial 9 (MB9)

In this activity, you will work through a case study of a single individual who exhibits changes in their skeleton resulting from experience of disease or injury during life.

You will consider the features of the individual (age, sex, and pathology). Taking into account their mortuary and lifeways contexts, you will then assess whether they likely required, and received, health-related care at some stage. Remember that ‘health-related care’ is defined along a continuum spanning ‘hands-on, intensive care’ at one end, and ‘accommodation of difference’ (i.e. adapting environment and expectations to allow participation) at the other.

Note: As in most bioarchaeological research, you may not have all the data you would like in order to be completely confident in your conclusions. Hint: focus on the likely impacts of the skeletal changes (described below) on ability to function independently, and to fully participate, in the specific community setting at that particular time in history.

Read the case study and complete the *Short-Form Index of Care* to the best of your ability.

MORTUARY CONTEXT:

- The skeletal remains of Man Bac Burial 9 (MB9) were recovered from a cemetery site in Man Bac, Northern Vietnam, which dates to around 2000BC (Fig. 1).
- The cemetery has only been partially excavated, and over 100 individual remains have been found to date. It may have served a number of local communities over two or more generations.

THE INDIVIDUAL:

- MB9 was assessed male; ~ 25 years; with approximately 60% of his skeleton represented.
- He was buried flexed (his knees pulled up to his chest) and in N-S orientation. Standard practice was supine burial (lying on their back) in E-W orientation. Two pottery vessels were found with him (most adults were buried with one or more larger vessels (Fig. 2)).

LIFEWAYS CONTEXT

- Community: small, sedentary, primarily hunter (fishing)-gatherer community, with fish comprising over 50% of dietary protein intake. Burial clusters suggest a number of a mixed origin, extended families.
- Landscape: estuarine, located at the mouth of a river on the Red River Delta; flat, strips of sandy soil interspersed with sharply rising, craggy, limestone columns.
- Climate: cool humid winters, hot wet summers.
- Economy: focus on hunting aquatic (sea and riverine) vertebrates, possibly some animal husbandry. Pottery evidence suggests local regional trade, jewellery and stone tool evidence suggests trade routes into southern China.
- Health: there is skeletal evidence for widespread general health stress, arising from parasite infection; nutritional deficiencies; and vulnerability to infectious disease (likely associated with increasing size of the settlement).

PATHOLOGY

Skeletal anomalies were immediately apparent on excavation. These are described below and indicated on [Figure 3](#).

- MB9's preserved upper vertebrae (C1-T3) were fused into a single block. At a minimum this severely restricted upper body mobility (Fig. 4), and very possibly impinged on the spinal canal and therefore on spinal cord (neurological) function.
- C1 (the atlas) was fused at an angle to the base of the skull, restricting head movement.
- All long bones were exceptionally gracile (i.e. slender and lacking in bone mineral density), particularly the lower limbs ([Figs. 5-6](#)). This extreme level of gracility in the lower limbs suggests absence of any weight-bearing activity for around a decade.
- Upper limb bones were also extremely gracile ([Figs 5-6](#)), but there are skeletal indications (not shown in the image) that very limited activity may have been undertaken.

Note: Vertebral fusion suggests the diagnosis of Klippel Feil Syndrome, a congenital condition (i.e. a condition present from around the time of birth). However, Klippel Feil Syndrome does not directly affect limb morphology.

YOUR TASK:

On the basis of the information above, fill out the *Short-Form Index of Care*. Keep in mind that more than one condition might be operating to affect MB9's experience, and that individual health conditions may interact to affect overall experience. In summary, here are the questions you will be addressing:

- Based on the skeletal evidence for pathology presented above, what kind of clinical and functional impacts do you think MB9 likely experienced?
- Given the lifeways context, could MB9 have looked after himself, or was care from others in his community likely needed to help him to manage these impacts?
- If MB9 needed care from others, what kind(s) of care do you think might have been required, and who might have provided this care? (Note: people can receive different types of care either at the *same* time (to address different impacts) or at *different* times (as their condition improves or worsens).

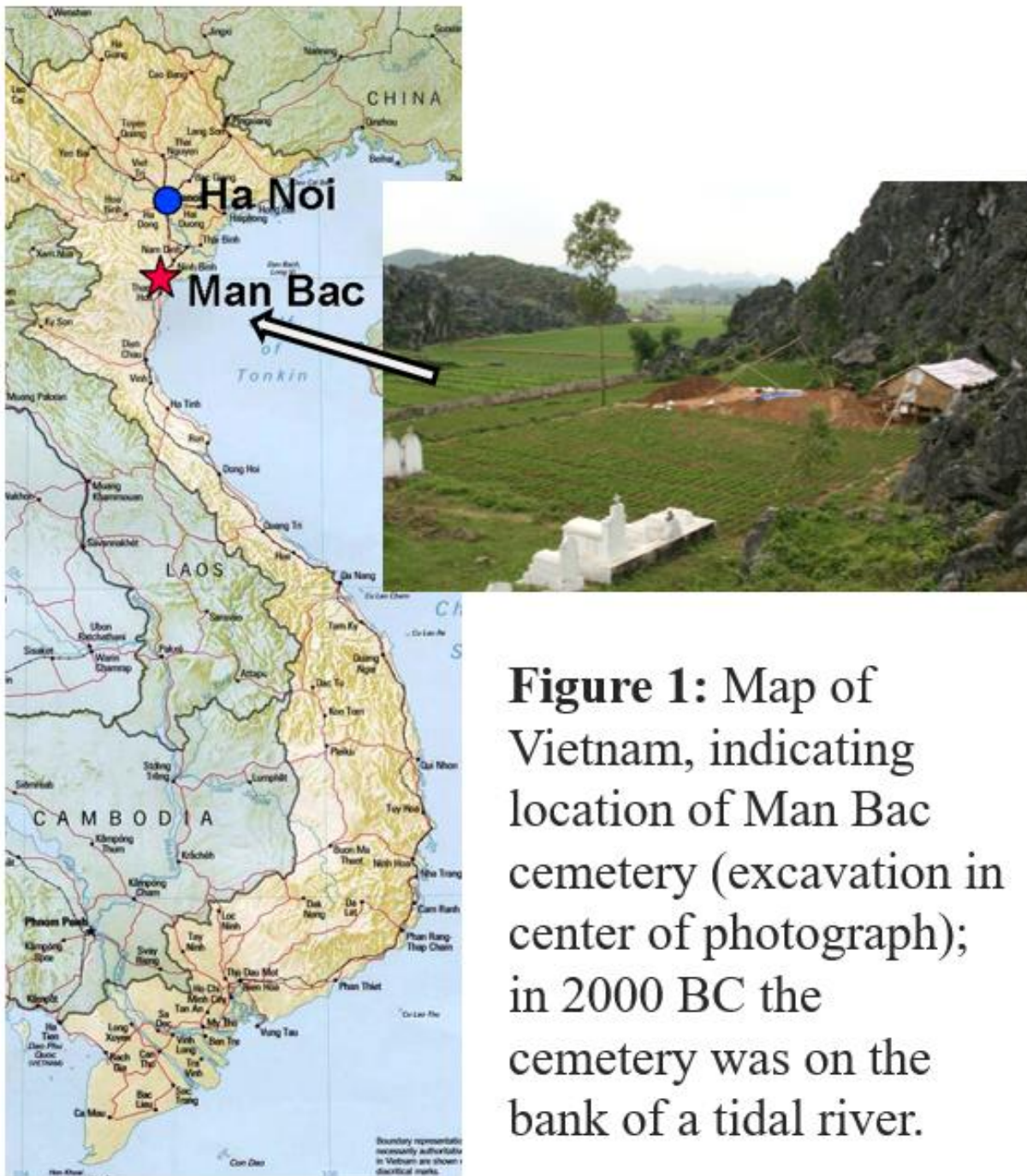




Figure 2: MB9 *in situ*. Two pots found with MB9 have been removed.

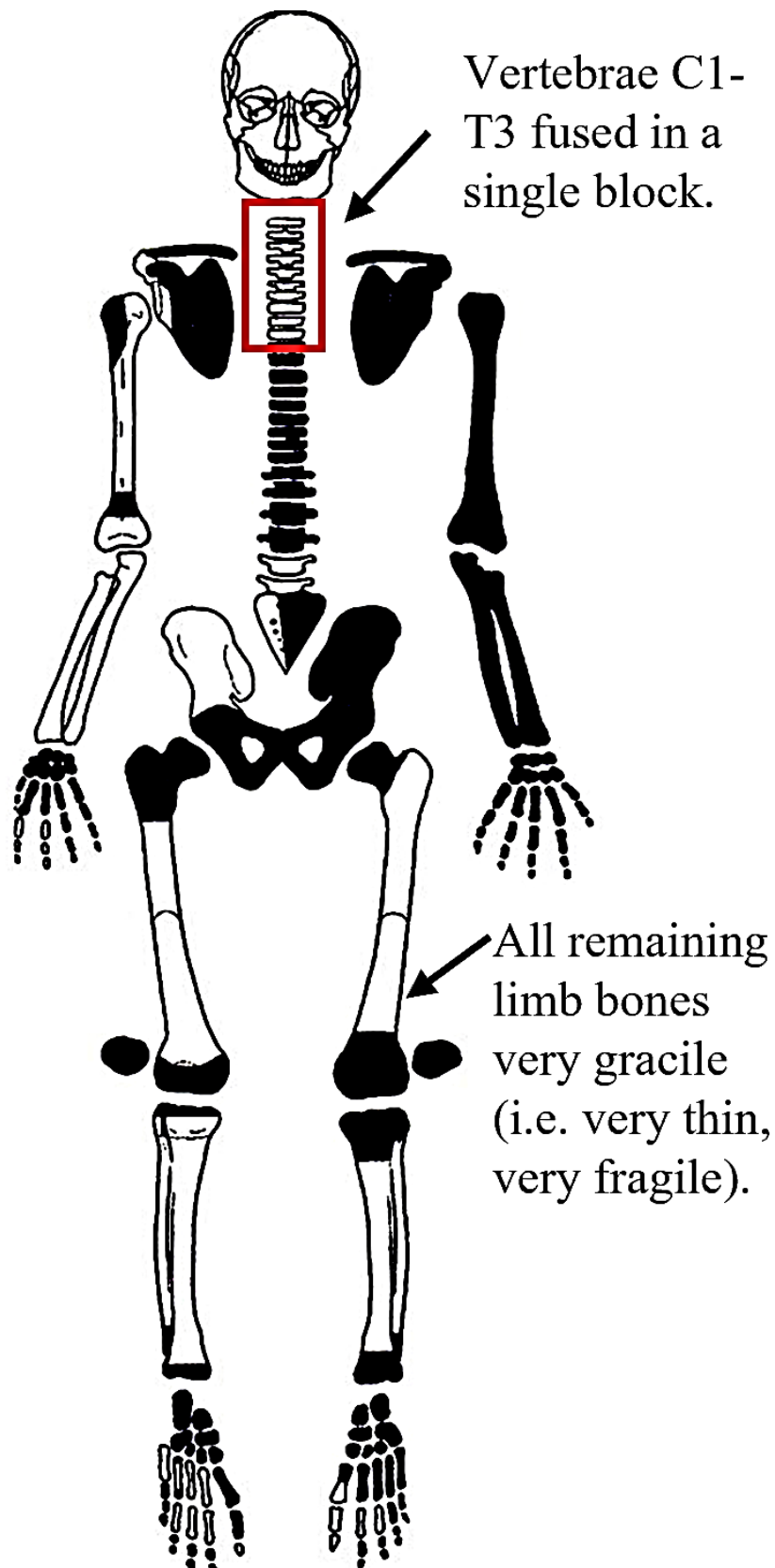
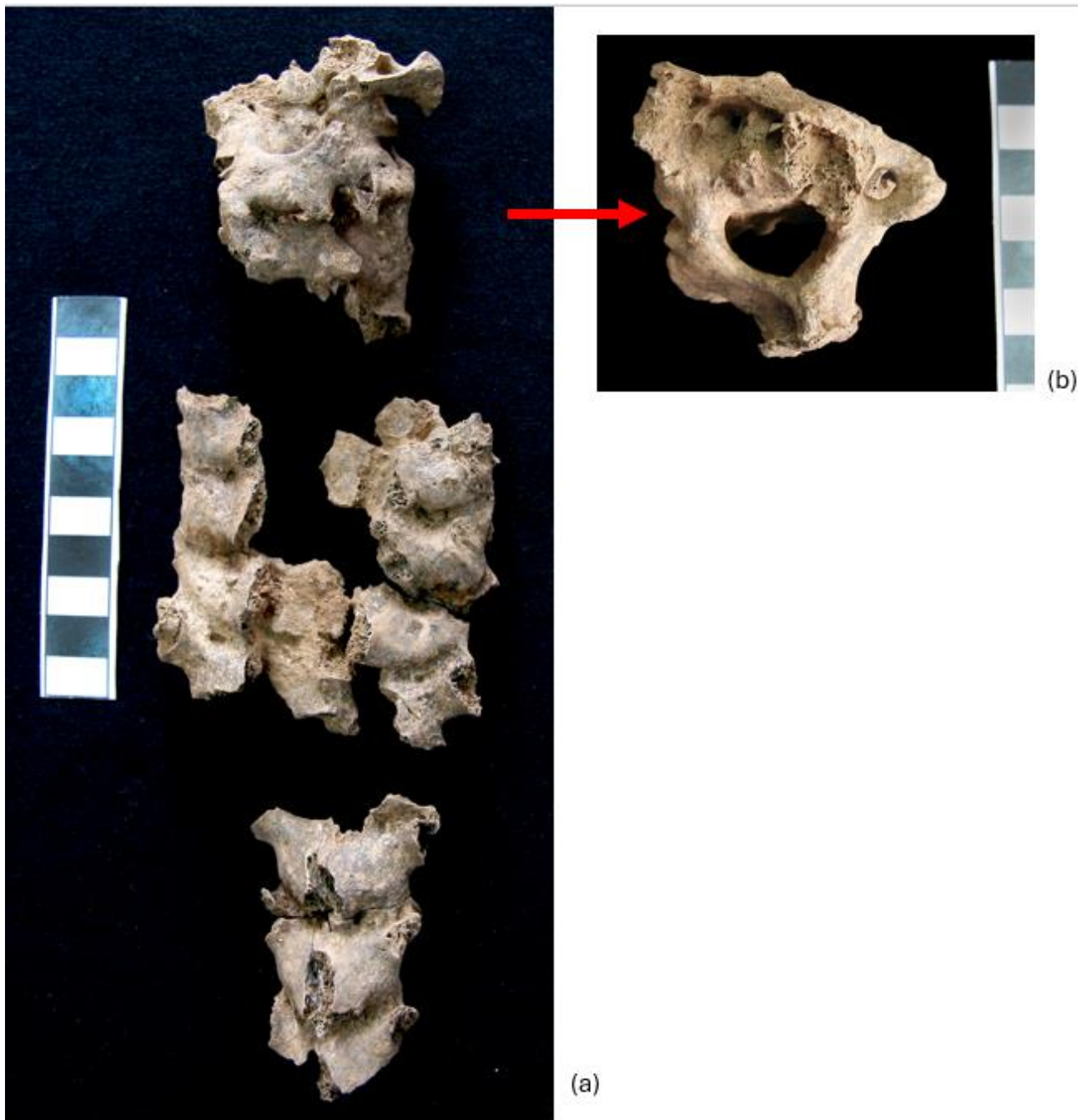


Figure 3: Schematic summarising MB9 skeletal preservation (black = missing elements) and showing areas of the skeleton affected by pathological alteration.

**Figure 4:**

(a): Posterior aspect of MB9's vertebrae C1-T3, showing ankylosis (fusion) of vertebral bodies. (C4-C7 vertebral bodies disintegrated on lifting MB9's remains.)

(b): (Above) Superior aspect of C1-C2 (atlas and axis) illustrating rotary fixation. Rough bone (circled) marks the location of fusion of C1 articular facet to the right occipital condyle (at the base of the skull).



Figure 5: Extreme gracility illustrated in MB9's left femur (top) and right ulna (bottom). Note the condition of bone in the close-up of the cortical bone of the left femur (red arrow) (N.B. femur and ulna are not to the same scale – refer to the individual scales for accuracy.)

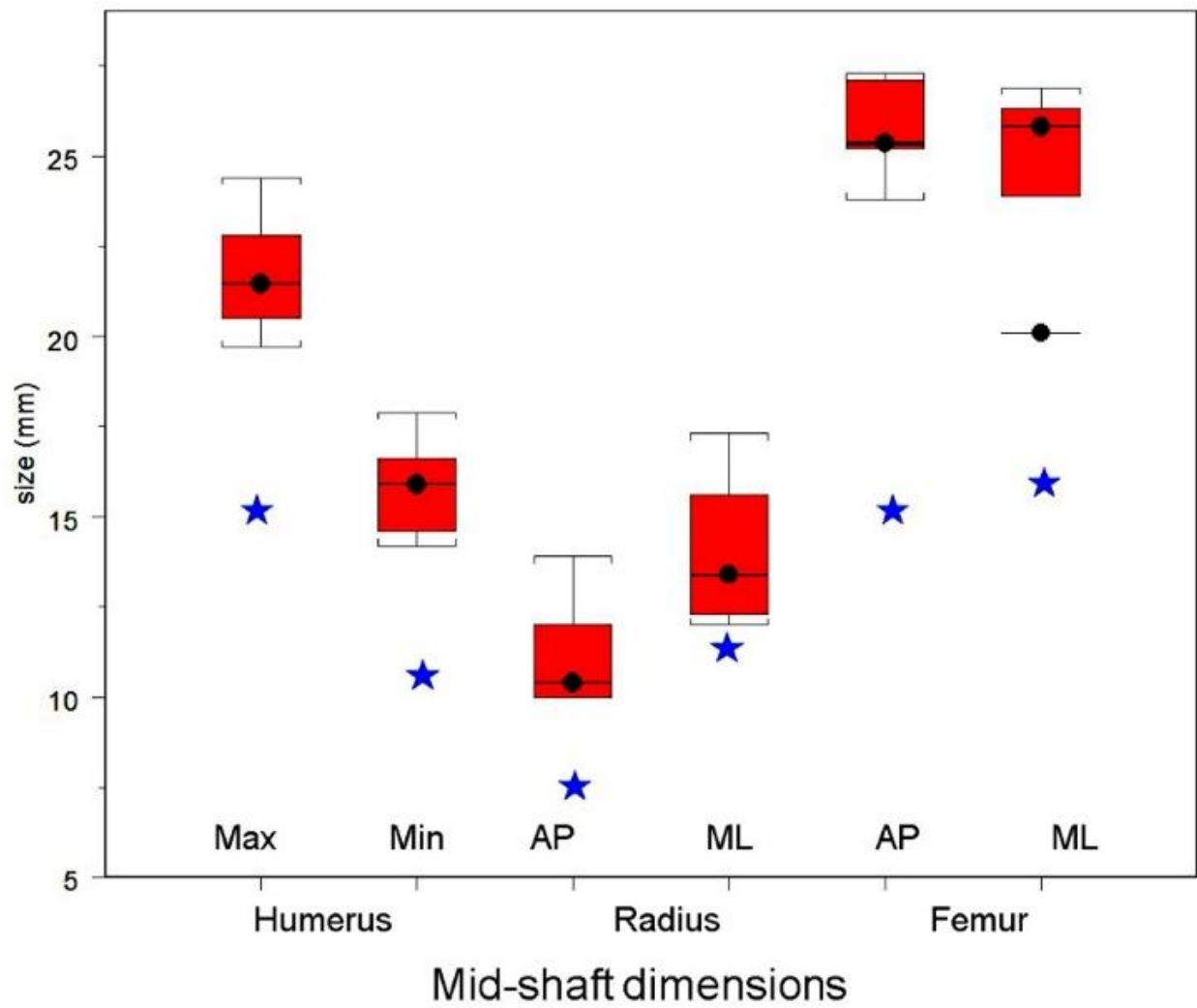


Figure 6: MB9 limb dimensions (blue stars) compared to 6 other Man Bac adults (measurements in millimetres).