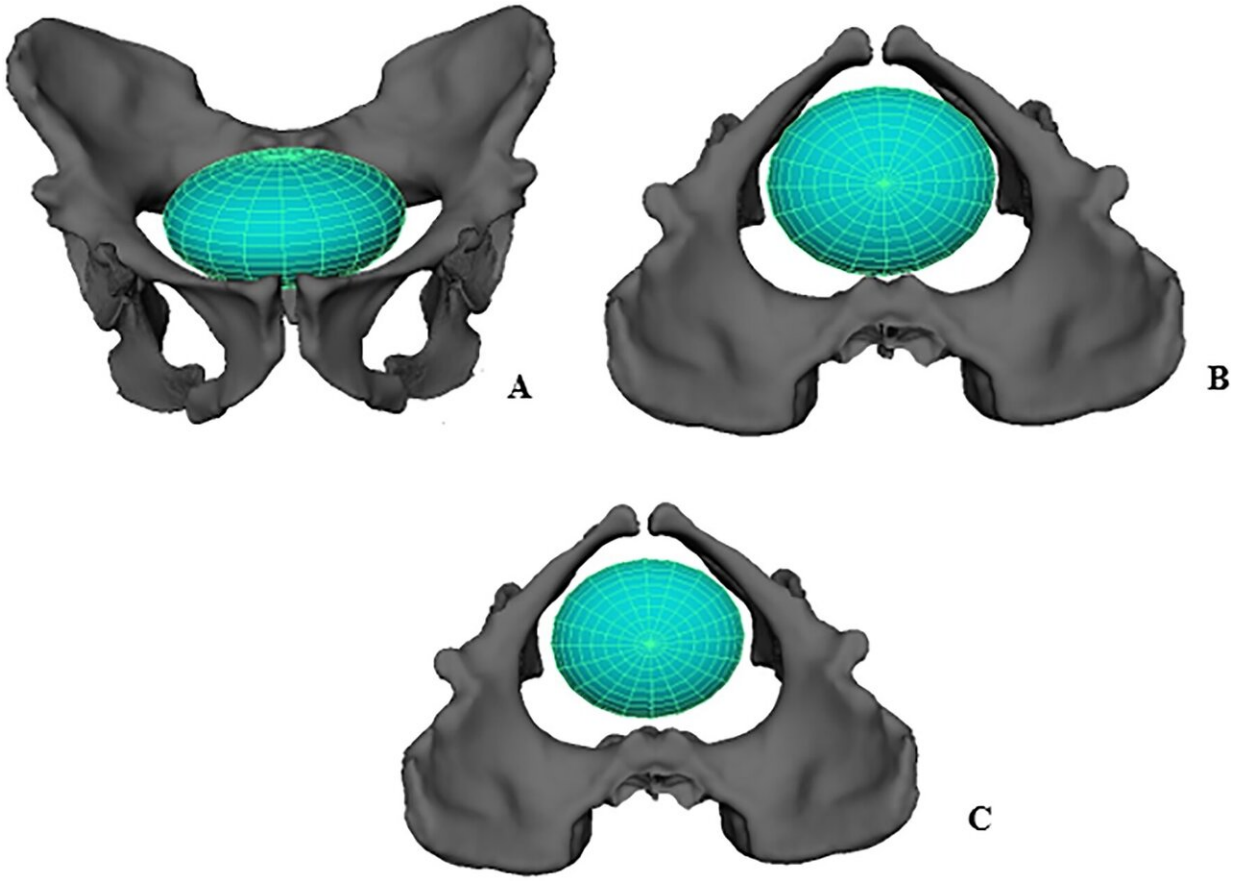
Computer simulations show human ancestors would have had an easier time giving birth than modern women

September 20 2019, by Bob Yirka



Ellipse representing a neonatal A. sediba head at the pelvic. A. inlet, frontal view B. inlet, superior view C. midplane, superior view. Reconstructed pelvis is shown with the MH1 ischium. Notice that the modeled A. sediba neonatal cranium can descend into the midplane without bony constraints, unlike the condition typically found in modern humans. Credit: *PLOS ONE* (2019). DOI:

10.1371/journal.pone.0221871

A trio of researchers with Boston University and Dartmouth College has found that one of our ancient ancestors likely had a much easier time giving birth than modern humans. In their paper published on the open-access site *PLOS ONE*, Natalie Laudicina, Frankee Rodriguez and Jeremy DeSilva describe how they created 3-D computer models of some of our ancient ancestors and compared them with modern humans and chimpanzees—and describe what they found.

For many women, childbirth is a long, painful and difficult process. Prior research has suggested the reason childbirth is so much more difficult in humans compared to apes or other animals is because we evolved to walk upright, and because our babies have very large heads. As humans developed an upright gait, our pelvises changed in ways that made the birth canal narrower. During birth, a modern human baby must turn in the womb several times as it is pushed through the birth canal by the pelvic muscles.

In sharp contrast, chimpanzees give birth in short order and appear to experience very little pain. In this new effort, the researchers wondered about the birth experience for one of our ancestors, *Australopithecus sediba*—a hominin that lived approximately 1.95 million years ago. To find out, they created a 3-D representation of an *A. sediba* pelvis using imagery from several fossils. While they were at it, they also created 3-D representations of *Australopithecus afarensis* and *Homo erectus*. And for additional comparison, they also created 3-D images of a modern human and a chimpanzee pelvis. To study the degree of difficulty of giving birth, the researchers also added baby human skull-sized objects to the 3-D images as they would normally sit in the birth canal.

The researchers report that the size of the *A. sediba* birth canal was quite large compared to the size of the skull of the baby that would need to pass through it. They suggest this indicates that compared to modern women, *A. sediba* would have had a much easier time giving birth. The researchers also note that contrary to popular belief, the evolution of the birth canal was not a clearly defined path from big to small—prior research has shown that an earlier ancestor, Lucy, (*Australopithecus afarensis*) likely had a difficult childbirth.

More information: Natalie M. Laudicina et al. Reconstructing birth in Australopithecus sediba, *PLOS ONE* (2019). DOI: 10.1371/journal.pone.0221871