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Elk ivory pendants in Alberta

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ABSTRACT

Twelve elk tooth pendants from Alberta are examined here for sex, age, and method of manufacturing the pierce hole. Ethnographic and historic records are used to place the collection in context and understand the significance of elk ivories on the Northern Plains. Elk canine teeth were highly valued by Plains First Nations people for thousands of years. The teeth were carved and polished into pendant beads used in large numbers to adorn clothing for women and girls. Elk have only two canines and were not killed in large numbers like bison, therefore, collecting one or two hundred teeth to decorate a dress required great hunting skill. Elk ivories represented wealth, prestige, love, and long life. In the 1890s, First Nations people had limited access to elk but the tooth pendants were so important that they carved imitations out of bone and continued to decorate clothing with them.

KEYWORDS

Elk, tooth, canines, ivories, pendant, elk tooth dress, Wapiti, *Cervus canadensis*

1. Introduction

Elk (*Cervus canadensis*) are an important animal to First Nations people and have been for millennia. Elk remains are found in archaeological sites across Alberta and elk are depicted in rock art as petroglyphs at Writing-On-Stone Provincial Park (Figure 1) and as a pictograph at Grotto Canyon (Keyser and Klassen 2017). The shape and size of the body and antlers in rock art tells us these figures are elk. Their appearance in rock art and the skill with which they are carved and painted shows the importance of this animal to First Nations. Elk were hunted for food, their hide was used for clothing, their antlers were made into a variety of tools, and their eye teeth were shaped and polished into pendant beads used to decorate clothing (Grinnell 1892; Kidd 1986; Wissler 1986). All elk have two upper canine or eye teeth. Sometimes called ivories, these teeth are vestigial tusks and are actual ivory. This paper describes how morphological criteria was employed to determine the sex and age of decorative elk canine teeth found at archaeological sites

in Alberta. This is followed by a brief discussion of the value of elk ivories and their use by First Nations people into the Historic Period, including the use of bone imitation elk teeth on two Blackfoot dresses.

2. Elk tooth pendants from Alberta

I was able to examine 12 elk teeth for this study, 10 from the archaeology collection at the Royal Alberta Museum (RAM), and two from the collection of the Gem of the West Museum in Coaldale Alberta. Five teeth come from archaeological contexts, four are from the published Elk Point burial (Baldwin 1978), and three are from private collections. The teeth have been found at sites in southern and central Alberta (Figure 2), but to my knowledge, elk ivories have yet to be found at archaeological sites in the northern parts of the province. The five pendants from archaeological contexts and the two from the Gem of the West Museum all have pierce

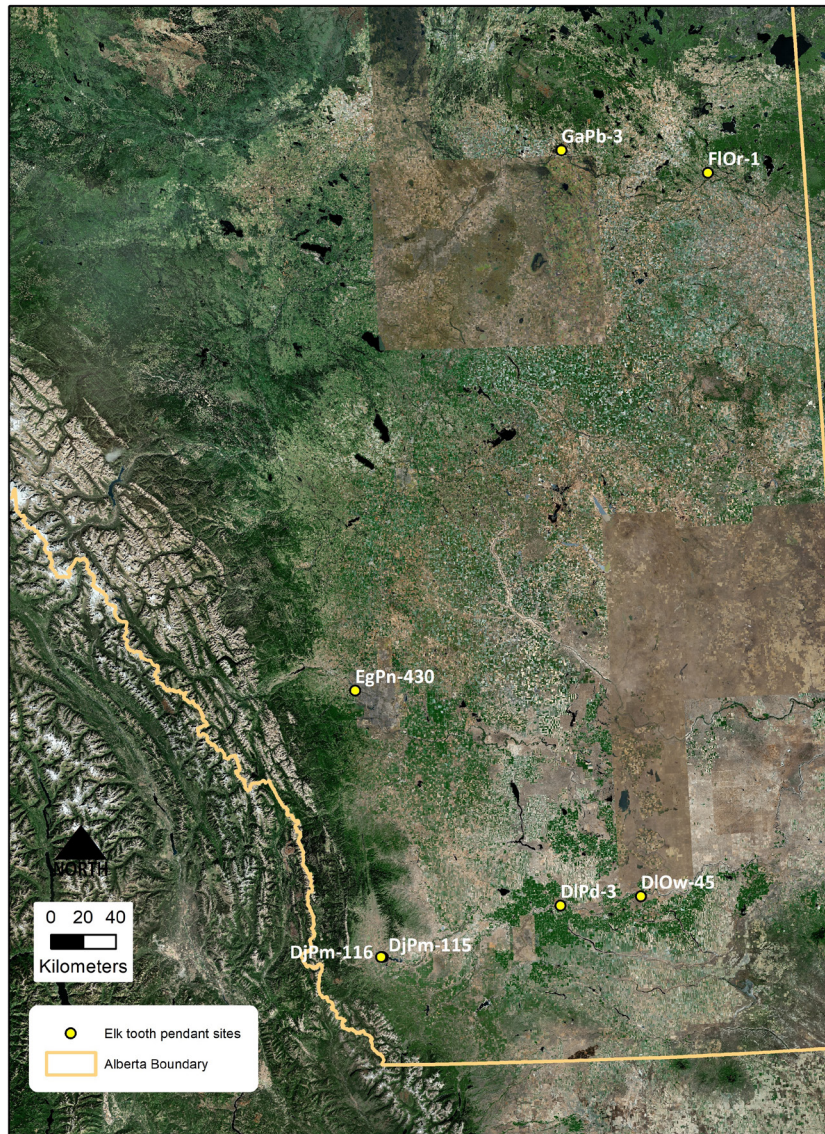


Figure 1. Elk petroglyph DgOv-2.

holes, while the four from Elk Point and one from a private collection at the RAM, do not (Figure 3). The pendants range in date from 2540 BP to 150 BP (see Table 1), based on associated radiocarbon dated material and archaeological find contexts, indicating that the use of elk teeth for ornaments is an ancient practice.

3. Sexing and aging elk canines

Greer and Yeager (1967:408–417) of the Montana Fish and Game Department published a method for identifying sex and age of elk based on ivories. They collected eye teeth for each of the age classes of males and females as a reference series. By comparing teeth to this reference collection, age categories and sex can be assigned quickly and reliably.



Map prepared by Alberta Culture and Tourism: Historic Resources Management Branch.
Sources: Natural Resources Canada, Alberta Environment and Parks, Archaeological Survey of Alberta.
Projection: 10TM AEP Forestry, NAD1983

Figure 2. Map of elk tooth pendant sites in Alberta.



Figure 3. Elk tooth pendants from Alberta.

Table 1. Elk ivories in Alberta.

Figure	Catalogue Number	Sex	Age of Animal	Date	Weight (g)	Diameter of pierce hole (mm)	Shape of pierce hole
Fig. 3:1	DjPm-115:76919	f	2.5–3.5	1100–200 years old (Dau 1997)	2.19	3.941	cylindrical hole, possible red ochre
Fig. 3:2	H69.3.1070 GaPb-3	f	3.5	150 years old (Smythe 1968)	2.58	1.673	cylindrical
Fig. 3:3	EgPn-430:29673	m	2.5	200 years old (Vivian et al. 2005)	2.38	4.508	cylindrical hole, but drilled at a slight angle
Fig. 3:4	H68.18.152	m	5.5–6.5	n/a	3.06	n/a	n/a
Fig. 3:5	FLOr-1:108	f	5.5–6.5	218–208 years old (Baldwin 1978)	1.74	n/a	n/a
Fig. 3:6	FLOr-1:10	f	5.5–6.5	218–208 years old (Baldwin 1978)	1.81	n/a	n/a
Fig. 3:7	DIOw-45:15	m	2.5–3.5	n/a	6	3	biconical, drilled from both sides, ridge remains in the middle
Fig. 3:8	DIOw-45:16	m	2.5–3.5	n/a	4	3	biconical, drilled from both sides, ridge remains in the middle
Fig. 3:9	DIPd-3:831	f	3.5	540±134 BP (S-2038; Vickers 1987)	1.9	3.28	biconical, drill from both sides, ridge remains in the middle, drilled at a slight angle
Fig. 3:10	DjPm-116:2229232	f	5.5–6.5	2590±100 BP (AECV #1234C; Landals 1993)	2.1	4.692	cylindrical hole
Fig. 3:11	FLOr-1:106	m	2.5	218–208 years old (Baldwin 1978)	4.11	n/a	n/a
Fig. 3:12	FLOr-1:109	m	2.5	218–208 years old (Baldwin 1978)	4.09	n/a	n/a

3.1 Determining sex

Male and female teeth are quite different from each other. Male teeth are larger and heavier than female teeth (Greer and Yeager 1967). The male root is nearly square while that of the female is rectangular or elongated and V-shaped (Figure 4). In males, the width of the root end exceeds half the maximum width of the crown, while in females, the root end is less than half the width of the crown. Male teeth generally have a triangular crown while in females, it is rhomboid. In the lingual, or tongue side view, male teeth have a gentle angle at the join between the root and the crown, while females have a sharper one (Greer and Yeager 1967:412). Based on these criteria, six of the specimens in this study are identified as female (Figure 3:1, 2, 5, 6, 9, 10)—they are smaller, weigh less, have rhomboid shaped crowns, sharp angles at the join between the root and the crown, and a narrow root. Six are male (Figure 3:3, 4, 7, 8, 11, 12)—they are larger, weigh more, have triangular shaped crowns, a gentle angle at the join between the root and the crown, and a wide root (Table 1).

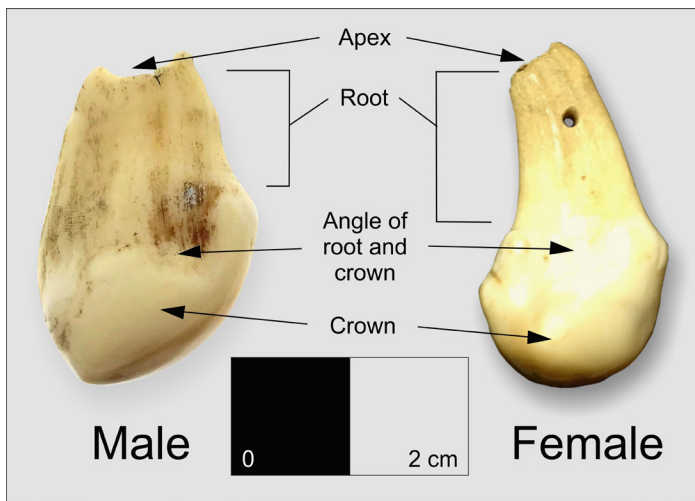


Figure 4. Male vs. female elk teeth.

3.2 Age of females

Several characteristics inform the age determination of female teeth. Firstly, the wear on the crown, as well as the length of the root and crown, in relation to the overall length, indicate relative age (Greer and Yeager 1967). In general, wear on the crown increases with age, and both the root and the crown get smaller as the animal ages. Also, the apex of the tooth gradually closes as the animal ages and grooving around the base of the crown, where it meets the root, increases with age (Greer and Yeager 1967:413–416). However, when the tooth has been shaped, polished, and pierced, many of these features are less obvious.

GaPb-3:1070 (Figure 3:2) is a female tooth determined to be from an animal 3.5 years old, and has many of its natural features still visible. The apex of the tooth is still open and looks hollow inside. The length of the root is more than half the length of the entire tooth. A substantial part of the crown remains—the wear on it is quite light. When comparing this tooth with two other female specimens, FIOr-1:10 and FIOr-1:108 (Figure 3:5, 6), the aging characteristics become apparent. In the latter teeth, the apex is completely closed and the crown is considerably worn down to about one third of the total length of the tooth. There is also a groove around the base of the crown of these two teeth, something that becomes more prominent with age. Based on these characteristics, FIOr-1:10 and FIOr-1:108 were determined to be from animals 5.5–6.5 years old.

Some of the female tooth pendants are highly polished and modified (Figure 3:1, 9, 10); the division between the crown and the root has been smoothed out and polished and the line separating these two parts is no longer visible. As well, the apex of each of these female teeth appears to have been removed and the top part of the root has been rounded and then pierced. Despite these modifications the age of the specimens can still be determined from the size and wear of the crown.

Based on these criteria, three teeth belong to females 2.5–3.5 years old and three belong to females 5.5–6.5 years old (Table 1).

3.3 Age of males

Wear on the crown is also an indicator of age for male teeth. The crown has a triangular shape in a young bull and wears to an angle as the animal ages (Greer and Yeager 1967). Once the enamel of the crown is worn through, concentric buff and tan coloured rings can be seen. As with female teeth, the apex of the male tooth also gradually closes with age, but the sides of the apex may close before the space in between, creating a crescent shape. The length of the root and crown in relation to the overall length is also important. The more worn the crown the older the animal is.

Most of the male teeth in this study (Figure 3:3, 7, 8, 11, 12) are from young bulls, 2.5–3.5 years old. The crowns on these specimens are only slightly worn to an angle and the apices have not yet completely closed. Specimen H68.18.152 (Figure 3:4) however, appears to be from a much older bull, 5.5–6.5 years old. The crown is worn to an angle and the sides of the apex are closed. Tan coloured rings can be seen on the surface of the crown indicating considerable wear.

Compared to the female specimens, the male teeth are less heavily modified as, on each tooth, the line between the root and crown is still visible, as is the apex. EgPn-430:29673 (Figure 3:3) has the most modification of the male teeth as both the line between the crown and the root, as well as the apex, have been smoothed. This is visible despite the discolouration of the tooth.

The application of these morphological criteria to the Alberta specimens suggests that five teeth belong to males 2.5–3.5 years old and one tooth is from a male 5.5–6.5 years old.

4. Pierce holes

Seven of the 12 tooth pendants are perforated. Examination of the pierce holes gives information about the type of tool and the method used to create them. All the pierce holes appear to have been made with a stone tool, likely a tapered drill, except for one, which may have been made with a metal tool. A metal tool can be thinner and smoother than a stone drill which is thicker and has an uneven surface of flakes scars from its manufacture.

DIPd-3:831 (Figure 5:C, D) has a hole that is at an angle, indicating that the tool used to make it was held at an angle, not perpendicular to the surface. The hole is also biconical, with a slight ridge around the centre of the interior of the hole, indicating that the hole was worked from both sides with a stone drill, likely tapered. (Wood 1957:382; Adams 2002:214). This tooth also has an incision across the root on both sides of the hole. Perhaps this is where the pendant was tied onto a garment and the incision is the result of wear from material used to attach it to a garment. The incision is not clean but slightly irregular.

A male tooth, EgPn-430:29673 (Figure 5:G, H), has a hole similar to that of DIPd-3:831 (Figure 5:C, D). The drilling tool was held at an angle and there is a ridge indicating that the hole was made from both sides.

The two teeth, DIOw-45:15 and DIOw-45:16 (Figure 5:A, B), also have holes with a very slight ridge in the centre and appear to have been made by stone tools. These holes are perpendicular to the tooth and do not appear to have been drilled at an angle. Perhaps this indicates a different way of holding the tooth while making the hole, than in the previous examples.

A female tooth, DjPm-115:76919 (Figure 5:E), has a very large hole that is highly polished. Any ridges and evidence of manufacture were worn off in the polishing of the pendant.

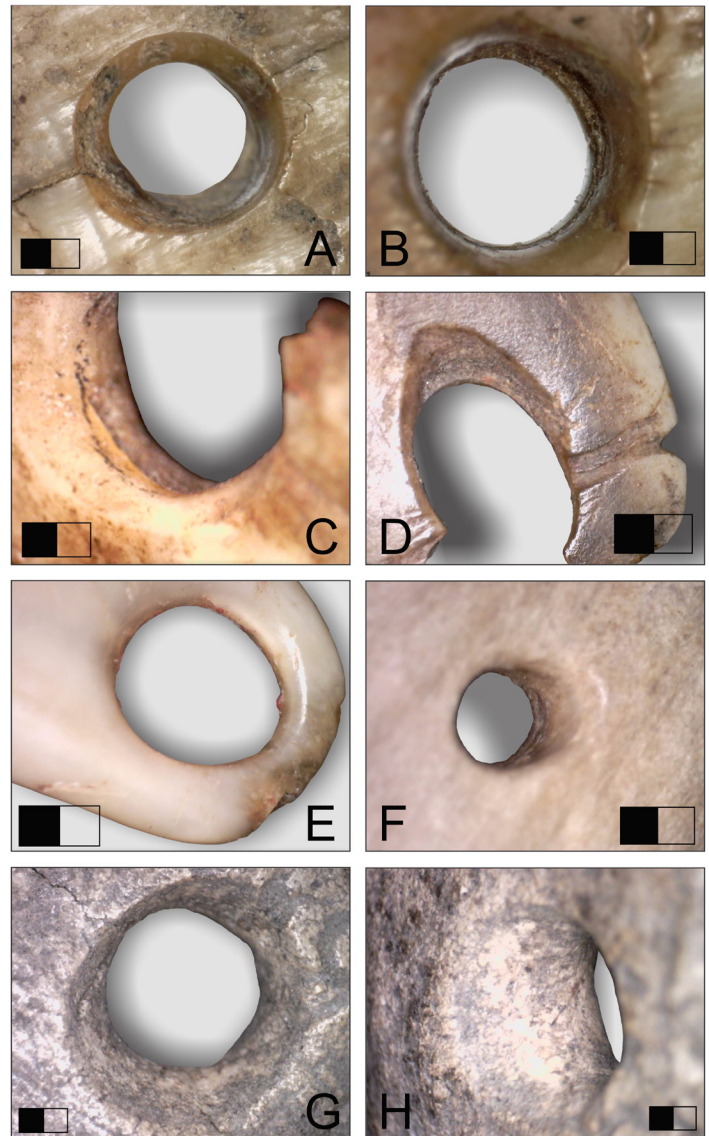


Figure 5. Microscope images of tooth pendant pierce holes. The scale bars in images A, B, C, F, G, and H are 1 mm long and the scale bars in images D and E are 2 mm long.

Another female tooth, GaPb-3:1070 (Figure 5:F), has a very small hole that is straight and cylindrical and the diameter of the hole is the same on both sides of the tooth. The small diameter and the precise cylindrical shape of this hole, as well as the fact that it was found at a fur trade fort (Fort White Earth), suggests that it was likely made with a metal tool.

Occasionally, elk teeth are found in burials (Wood 1967:382) and are unperforated (Figure 3:5,6,11,12).

5. Summary of analyses of elk tooth pendants

Using Greer and Yeagers' 1967 study, the sexing and ageing of elk eye teeth is quite reliable. Their size and shape make the female and male teeth distinct from each other

and the wear that occurs with age allows for a determination of the age of the animal. Seven of the 12 teeth have pierce holes. Six were made with a stone drill and are cylindrical or bi-conical with an interior ridge showing drilling from both sides. One was made with a small metal tool as the hole has a small diameter and no interior ridge and was found at a Fur Trade fort. The drilling of the holes suggests that there were various ways of approaching the manufacture of the hole, such as holding the drill perpendicular to the tooth or at an angle. These methods create differently shaped pierce holes (d'Errico and Vanhaeren 2017:219).

6. Historic references

What is the evidence for how these pendants were used in Alberta? Several early written accounts mention elk teeth and describe their value and importance. Grinnell (1913:240) discusses elk teeth and marriage arrangements of the Blackfoot:

A chief's daughter would already have plenty of good clothing, but if the girl lacks anything, it is furnished. Her dress is made of antelope skin, white as snow, and perhaps ornamented with two or three hundred elk tushes. ... Elk tushes were highly prized, and were used for ornamenting women's dresses. A gown profusely decorated with them was worth two good horses.

Grinnell (1892:197) also notes that elk teeth were sometimes used for necklaces and bracelets.

Maximilian (1843:249) also discusses women's clothing:

... it is a long leather shirt, coming down to their feet, bound round the waist with a girdle, and is often ornamented with many rows of elks' teeth, bright buttons and glass beads. ... The girls are dressed in the same manner as the women, and their dresses are generally ornamented with elks' teeth, for which the Indians pay a high price.

Mandelbaum (1940:209) also notes the importance of elk teeth:

Necklaces were made of buffalo teeth, elk tusks, or bearclaws strung on sinew. Women's dresses were often ornamented with elk tusks and bearclaws in conjunction with a good deal of quillwork, beadwork, and some painting.

Wissler and Duvall (1908:84) document an Elk Woman story of the Piegan in which a very powerful elk is angry

with his wife and wishes to kill her with a medicine song. When he tries, she uses her power to turn into a woman and knock over a tree with a hooking motion of her head. The song she sang was, "My wristlets are elk-teeth; they are powerful." The Elk Woman figure and the power the teeth give her, shows the connection to women and the spiritual power of the teeth.

Densmore (1918:176) noted that because elk ivories are so durable, the Lakota equate them with long life. Loendorf (2010) connects the representations of elk ivories with love medicine among the Crow, and states that elk teeth are symbols of enduring love, therefore clothing with elk ivory pendants symbolized eternal love for the wearer.

It is clear from these references that elk teeth were materially and spiritually very valuable to First Nations people, especially since one dress decorated with them could be "worth two good horses" (Grinnell 1892:197). Elk were not killed in mass numbers in pounds or jumps like bison. Elk do not gather in such large numbers as bison and there are no known mass elk kill sites in Alberta. Many individual kills would be required to collect enough teeth to decorate a dress. Therefore, to acquire 200–300 teeth for a garment required great hunting skill and time. Perhaps the teeth were also traded in order to amass enough.

By the early 1890s, First Nations people were confined to reserves. At this same time there were severe population declines of game animals, including elk. However, the importance of dresses decorated with elk teeth persisted. They were special garments reserved for ceremonies and celebrations and they continued to be made, but in the absence of available game, people carved imitations of elk teeth from bone, as evidenced by specimens at the Royal Alberta Museum.

The Blackfoot people have always communicated important information through clothing. From a distance, a Blackfoot person could be identified by their style of dress. Colour, pattern, and trim conveyed information such as an individual's status, family affiliation, or special relationships with certain animals (Wissler 1986). These garments were more than beautiful clothing. They embodied and expressed values and spiritual beliefs at the core of Blackfoot life (Berry, personal communication 2017).

7. Imitation pendants

The Royal Alberta Museum's Indigenous Studies program is fortunate to have two Blackfoot dresses decorated with imitation elk teeth. By looking at these dresses I had

the opportunity to understand how elk teeth were used and what they were meant to communicate. I was also able to compare the imitation teeth to real teeth to see what characteristics were important and copied in the imitations. Did they copy male or female teeth? Did they imitate the aging characteristics such as an angled crown?

One of the dresses is a young girl's dress (H88.94.127; Figure 6), for a child of five or six years old, made in the 1890s. It may have been made for a *minipoka*, a child who becomes involved in ceremonies at a young age. Someone spent many hours carving 189 imitation elk ivories and sewing them onto her dress. Elk teeth represent wealth, prestige, and hunting skills. Elk ivories also symbolize long life as they remain long after the other parts of the animal have decayed (Loendorf 2010). An elk tooth dress was a wonderful gift for a child to wish them a long and healthy life. When the girl wore this dress, all who saw her would know the honour and love her family had for her and exactly what was her status in the family. The majority of the teeth on

this dress have been carved to look like young male teeth, as they are large and have a square root and a triangular crown. About 10 out of the 189 teeth look like female teeth.

The second dress is a woman's dress (H89.220.150; Figure 7). It is Blackfoot and made of hide but the age is unknown. It is decorated with over 400 imitation elk teeth. Like the child's dress, the vast majority look like young male teeth (Figure 8). They have triangular crowns, square roots, and some have wear angles on the crown (Figure 8:1). One tooth looks female (Figure 8:2) with an elongated V-shaped root and a rhomboid crown. Many of the teeth on this dress have a thick, red, paste-like substance smeared over the area of the pierce hole, that may be ochre.

Why are the imitation teeth on both dresses predominately male? The root of the male tooth is square and would be simpler to carve than a female tooth whose root is narrower and V-shaped. Male teeth are also larger, more visible, and take up more room on the garment. Fewer imitations



Figure 6. Blackfoot child's dress, H88.94.127.



Figure 7. Blackfoot woman's dress, H89.220.150.



Figure 8. Imitation elk teeth on H89.220.150.

would need to be carved to fill the garment and larger teeth look more impressive. All cancellous tissue has been carefully removed from the bone on all the imitations so the artifact has a good resemblance to an actual elk tooth (Wood 1957:382).

One of the archaeological specimens, DjPm-115:76919 (Figure 3:1), has a very clean ivory colour with not much patina. A photo of the pierce hole of this tooth, enhanced through the colour enhancement program DStretch, reveals traces of a red substance inside and around the edges of the pierce hole (Figure 9). Perhaps this is the same red paste (possibly ochre) that appears on the woman's dress, H89.220.150. It is important to note that the brown patina that naturally forms on the teeth shows up as a red colour when enhanced in DStretch, so a positive identification of ochre application is hard to make.

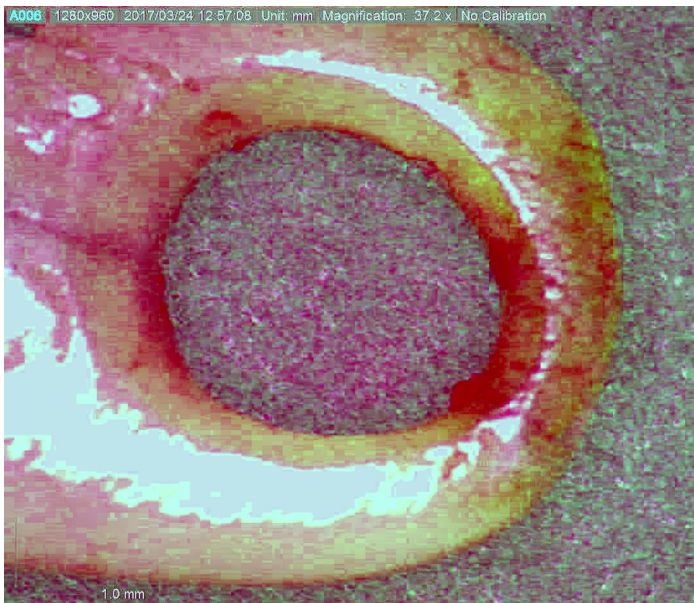


Figure 9. Pierce hole of DjPm-115:76919, enhanced with DStretch.

8. Discussion

The archaeological specimens are both male and female teeth, so both were clearly valuable. With only 12 teeth in the sample it is difficult to say what gender and age of tooth might have been preferred, if any. However, the two Blackfoot dress are decorated with imitations that most resemble younger adult male teeth. Perhaps these were preferred due to their size and visibility. The oldest tooth found in Alberta dates to 2590 BP (AECV #1234C; Landals 1993) indicating the antiquity of the value and use of elk teeth. Elk ivories communicated status, wealth, long life, honour and love, as well as power. In Blackfoot culture the pendants are strongly associated with women and used to create magnificent

dressers with hundreds of teeth. The story of Elk Woman confirms this strong association with women (Wissler and Duvall 1908:84).

The two elk tooth dresses decorated with bone imitations show us the importance and persistence of the spiritual and cultural value of elk teeth when the real teeth were not available. The carving of these imitations was a difficult and time consuming task. More than just decorative pendants, these ivories, real or imitation, represent something much larger and communicate a message both about the individual who wore them, their place in their community, and their culture.

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