



PRESENTACIÓN CASO

The man in blue

EL HOMBRE AZUL

Solla H.E.¹

¹ Departamento de Medicina Forense, Instituto Técnico Forense, Uruguay.

RESUMEN: El propósito de este trabajo es describir las últimas técnicas antropológicas forenses para analizar restos óseos para determinar sexo, raza, estatura, edad y realizar una identificación positiva de un hombre desaparecido hace más de 14 años. Según denuncia a principios de septiembre de 2015, varios restos óseos humanos fueron exhumados del patio trasero de una casa en un barrio pobre de la ciudad de Montevideo, y posteriormente trasladados a la Morgue Judicial Central para su análisis. Estos análisis indicaron que la víctima era un hombre blanco de unos 50 años y 167 cm de altura. No se pudo determinar la causa de la muerte. Con base en evidencias preliminares se sospechó que la víctima podría ser John Doe, un hombre que desapareció hace más de 14 años cuando tenía 49 años. Con base en evidencias reales y la confesión de su esposa sabe que realmente fue asesinado por ella y luego enterrado en el patio trasero de su casa, donde aún vive toda la familia, por lo que su cuerpo permaneció allí por más de 14 años hasta que se produjo la denuncia de una de sus hijas. La comparación digital se realizó utilizando dos fotografías de vista frontal de la víctima de diferentes edades y el cráneo desconocido. Este examen reveló que el cráneo se correspondía consistentemente con el individuo en las fotografías. Posteriormente, estos resultados fueron respaldados por un perfil de ADN. Por tanto, este caso muestra cómo las técnicas de Antropología Forense se pueden utilizar con éxito en investigaciones médico-legales vinculadas a casos sin resolver de hace más de 14 años.

PALABRAS CLAVE: Antropología Forense, caso sin resolver, superposición cráneo-fotográfica, Identificación, Uruguay.

ABSTRACT: The purpose of this paper is to described the last forensic anthropological techniques to analyze skeletal remains to determine sex, race, stature, age, and to make a positive identification of a man who disappeared more than 14 years ago. According with a complaint at the beginning of September, 2015, several human skeletal remains were exhumed from the backyard of a house in a poor district of Montevideo City, and later carried to the Central Judicial Morgue to be analyzed. These analysis indicated that the victim was a white man of about 50 years old and 167 cm tall. The cause of death could not be determinate. Based on preliminary evidence it was suspected what the victim might be John Doe, a man who disappeared more than 14 years ago when he was 49 years old. Based in actual evidences and the confession of his wife it knows that he really was murdered by her and later buried in the backyard at home, where all the family still lives, so his body remained there for more than 14 years until that a complaint was made by one of his daughters. Digital comparison were made using two victim's frontal view photographs of different ages, and the unknown skull. This examination revealed that the skull corresponded consistently with the individual in the photographs. Later, these results were supported by a DNA profile. Therefore, this case shows how Forensic Anthropology techniques can be successfully used in medico-legal investigations linked with cold cases of more than 14 years ago. skull with two surgical trepanations with a survival of 2 years and 24 days, in which the signs of bone regeneration are clearly appreciated.

KEY WORDS: Forensic Anthropology; Cold Case; Digital Skull-Photo Comparison; Identification; Uruguay.

CONTACTO: Email: hsolla14@gmail.com

1. INTRODUCTION.

Forensic anthropologists have developed numerous demographic techniques to understand the biology of people around the world. Many of these techniques derived from skeletal remains of known identity. For this reason case studies are ideal to test the validity of this techniques and Forensic Anthropology may function as a testing ground for this aspect of Biological Anthropology (1).

For almost three decades, Forensic Anthropology has been an active part of the coroner system in Uruguay and the number of cases has increased considerably since the inclusion of a resident forensic anthropologist to the medico-legal team and judicial system (2). This eventually led to a higher rate of positive identification of unknown human skeletal remains (3,4).

On September 2nd, 2015, several human skeletal remains were found buried in the backyard of a modest home located

in a poor neighborhood of Montevideo City, into Montevideo 14th District Police Department Jurisdiction. After preliminary observations in situ, the remains were transported to the Central Judicial Morgue for an in-depth analysis by the local resident forensic anthropologist, especially to determine sex, race, stature, age at death, cause of death, and eventually its identity. Once placed the skeletal remains on the autopsy's table in anatomical position to be analyzed (figure 1), the author notes that all the human skeletal remains corresponding to a single individual. The victim was not wearing any clothing and no bullets were found with the skeletal remains. The skeleton is almost complete, in good stage of preservation and there was not any injuries evidence. The body was found 4 feet deep blanket wrapped in a light color and a dark curtain. Three intact wires that form bonds at the level of the neck, wrists and legs are observed, they were probably used for transporting the body until the site of buried. It was suspected that skeletal remains could correspond to the missing husband of a woman who inhabits the humble home, she is 57 years old and lives there with five of his six children, four women and a boy. The skeletal remains

could be found according with a complaint made by one of the woman's daughters, who on the occasion of attending a party, was able to see her only brother dressed in the blue suit what his father allegedly wore when he went to Italy, 14 years ago for labor reasons, this according with his wife's version gave to his family and the neighbors, after he disappeared, when he is 49 years old. However, at the time her husband disappeared 14 years ago, there was suspected in the neighborhood that this woman had killed him, but no evidence had and therefore, no specific complaint was made and eventually the issue forgotten and the case was cold. This until September 2015, through a search warrant the macabre discovery was made. Once, being found John Doe skeletal remains, his wife confesses that more than 14 years ago she killed him using a big knife in self-defense as they fought in the bedroom and later, she had buried the body in the home's backyard. Apparently, his children ignored the fact and thought that his father had indeed, traveled to Italy for work, but he never come back. It is noteworthy that the couple had a long history of abuse by the husband, which were corroborated by their children, neighbors and relatives.



Figure 1: Show the human skeletal remains on the autopsy's table, and the three intact wires that form bonds at the level of neck, wrists and legs are observed.

The purpose of this work is to display the details of this rare cold case as an example of fatal domestic violence, and how through anthropological technical can get to identify the skeletal remains of missing people disappeared many years ago.

2. MATERIALS AND METHODS.

2.1. Osteological Analysis.

A set of anthropological procedures was followed to analyze the remains. The first was follow a correct chain of custody and the inventory of bones. Once inventory was finished, I noted that only very few bones were missing and the skeleton was almost complete. Several dental pieces were extracted for DNA analysis. Further examinations revealed no evidence that the remains had been attacked, damaged by predator or scavenging animals, nor insect were found and not disturbed by any other agent. The first sets of anthropological analysis dealt with the determination of sex, race, stature and age at death. Diagnosis of sex was made using skull and pelvis both morphological and metric features (5). As is typical for males, the skull was large and rugged with well-developed supraorbital ridges and mastoid processes. The occipital bone showed pronounced nuchal lines and protuberance, small frontal and parietal eminences, and a sloped forehead. The pelvis was also of a male type with a narrow subpubic angle, large acetabulum and narrow, deep greater sciatic notch (6). In addition to morphological analysis, determination of sex was made by discriminant function analysis of the skull, these formulae tested indicated the victim was a male (7). About racial affinity since a morphological point the victim showed a number of white characteristics such as deep nasal depression, a narrow nasal aperture, sharp sills, and a round and high skull (5). To confirm this, cranial and mandibular dimensions were put into discriminant function formulae derived from an American white sample (8). Stature estimation is another way to determine if the victim's body size was within the range of the reported missing people and also to rule it out if there is a large discrepancy. There are very few standards to estimate height from the skeleton. The most reliable is obtained from the long bones of the lower and, to a lesser degree, of the upper extremities. The given standard error of estimate can cover a safety range around the mean. In this case the estimation of stature was made using lengths of the femur and tibia and applying them to Trotter's regression equations for white males (9). The average stature was found to be 167 cm with about $\pm 3,27$ cms standard error of estimate. Age at death may be estimated from several methods. One of the most reliable morphological age estimations is the

assessment of the costochondral junction of the ribs (10). When applied to this case for white male, it was observed that pit noticeably deep with a wide U-shape. The walls are thin with sharp edges. The rim is irregular and exhibits some rather long bony projections that are frequently more pronounced at the superior and inferior borders. The bone is noticeably lighter in weight, thinner and more porous, especially inside the pit. These characteristics correspond to phase VI, an age between 43 and 55 years old at time of death (10). Ectocranial suture closure was one of the oldest techniques developed to estimate age at death (11). In this case the technique development by the author (12) using a Uruguayan sample. It is calculated from the total score of each section of suture and applying it to the regression equation: $Y = 0.950468x - 2.63467$. The total score was obtained using the traditional 0 (open) to 5 (closed) scale patterns and added up to a maximum score of 95. In this case the total score was 55 points which made the age about 49,65 years old, with a range of $49,65 \pm 5$ years. Evaluation of the male pubic symphysis pattern was based on Todd's (13) studies. Ventral margin croded at a greater or lesser extend of its length, continuing somewhat onto the symphyseal face. Rarefaction of face and irregular ossification. Disfigurement increases with age. This correspond to Todd's X phase analysis, this is an average age of 50 years old. Age estimation was also made from the size of the medullary canal of the proximal epiphysis of the humerus (14), results indicated that the victim was about 50 years with a range of 45 to 55 years old using the formula: $Y = 58.08 + 1.47(x-6:03)$, where x refers to the medullary canal size. This technique was derived on a Cuban sample of 94 males and females. The humerus was first sagittally sectioned in its upper third to determine how far the medullary cavity was advancing into the epiphyseal region. The surgical neck of the bone is taken as a reference point. If the cavity has not reached this point, the metric value is negative suggesting a young person. If the canal has advanced into the neck and even to the head, the person is in an older age category. Therefore, it is clear that the rib phase analysis, ectocranial suture closure pattern, pubic symphyseal metamorphosis and medullary canal enlargement suggested a lower range of 45 and gave an upper range of 55 years old at time of death. Then, a mean age of about 50 years was estimated for the skeletal remains. All the osteological analysis of the skeleton have shown that these were the remains of an approximately 50 years old white male and about 167 cm tall.

2.2. Interval Since Death.

Postmortem interval of time since death is one of the most difficult aspects of forensic assessment (15). In general, the time interval since death is determined by analyzing the remains through external observation, chemical-physical testing and estimating the deterioration time of artifacts like

clothing, shoes, etc. External observation includes factors like temperature, scavenging by animals and insect invasion (16,17). The second method includes chronological dating techniques, deterioration of various chemical elements and compounds like nitrogen, amino acid and fats (5). The third technique deals with the assessment of deterioration of fabrica, plastics, nylon and the like (18). In general the decomposition process in Uruguay is slow and may take as long as 2 or 3 years, when the remains were buried in a coffin. But the process of decomposition should proceed at a faster rate in cases like this where the body was not buried in a coffin. So, in this case the body is totally skeletonized and there was not any clothing to determine the rate of deterioration. Therefore, we determined the interval of time since death according to our forensic experience, the general aspect of the remains and any chemical-physical methods. Bones showed good aspect and consistency, they were not crimps, showing very little porosity, there was not adipocire remains and the medullar cavity of long bones was empty, these indicating an interval since death of at least 10 years ago. Chemical-physical method of the test for carbonate was also used, this is when a piece of bone is exposed to a few drops of 20 percent hydrochloric acid and produce a foam, this indicates the presence of dolomite-petrification. Younger specimens show a weaker reaction to the hydrochloric acid like in this case, this also is indicating a time since death of at least 10 years (5). Based on the evaluation of these facts, it was estimated that death might have occurred at the time John Doe's disappeared, this is 14 years ago. I could not find any contradiction neither skeletal examination nor the data submitted by the authorities and relatives.

2.3. Cause of Death.

It was obvious that the skull did not show any injuries. In general all the bones are in good stage of preservation and only several ribs are broken, but due to the excavation process and did not show any discernible ante-mortem health problems. Dental health was not good suggesting a person of low socioeconomic status. All these founds could be congruent with the fact that John Doe was killed with a big knife that penetrated into his abdomen not damaging any bone but only damaged soft tissue and abdominal organs causing suddenly his death as was later confessed by his wife.

2.4. Identification.

A complete forensic anthropological report on age, sex, race, stature, cause of death, and time since death was made by the author and sent to the judge in charge. As showed the analysis of the skeletal remains the victim was a white male of about 50

years old and approximately 167 tall, who died at least more than 10 years ago. As a positive identification was needed a number of anthropological procedures were put together to make it. These included skeletal characteristics, skull-photo comparison, and if it is possible to find any dental evidence. It was suspected that skeletal remains might have belonged to John Doe, a white man who was 49 years old at the time of his disappearance. Upon the suspicion that the victim was John Doe, it was decided that positive identification could be made comparing the skull with two pictures using superimposition techniques and a personal computer to aid in the identification.

The apparatus utilized was standard equipment and consisted of a Sony Digital Video Recorder Camera HD Model HXR MC-50P, personal computer, Panasonic Digital Mixer Model WJ AVES, Adobe Photoshop CS version 8.0.1 and Pinnacle Studio HD version 14.1 software. The photographs as well as skull were placed under the digital video recorder camera and illuminated by white fluorescent lamps. Then, the skull had been correctly oriented and adjusted so that it was as close as possible to that of the individual in the photographs, both images (skull and photographs), were then superimposed using the digital mixer for a detailed comparison. After, these images were digitized and stored into the PC using Pinnacle software. In the next step, several key anatomical landmarks were marked as a guide on skull and photograph using Adobe Photoshop software (figure 2). Adobe Photoshop software allows any desired combinations of photo-skull comparison, including removing the soft tissue to view the underlying skeletal structures.

The analysis showed that conformity was found between skull image and all recognizable proportions of head, face, eyes, nose and mouth on the photographs submitted for comparison. Also, the outline of the soft tissue on the skull was congruent with the facial contours lying in the photographs. The comparison revealed a full match of photographs and underlying skeletal structures (figure 2). Later, a complete report was elaborated indicating without any doubts that the remains analyzed belonged to John Doe. Dental comparisons could not be made because there was not any dental records to be compared. Regardless this proof of identification a DNA analysis was requested using several dental pieces. DNA evidence supported the original identification made by skull-photo comparison that, indeed, the skeletal remains belonged without any doubt to John Doe, who was killed by his wife using a big knife more than 14 years ago. But, his wife was not convicted, because the judge taken account the history of mistreatment by her husband for many years and considered what she kill him by self-defense and this cold case was then officially closed.



Figure 2: Shows anatomical landmarks using to compare skull and photography and skull-photo comparison obtained.

3. RESULTS AND DISCUSSION.

One of the most challenging aspects of the forensic sciences is the identification of the victim from the remains. As long as the anthropological characteristics do not exclude the victim, factors of individualization are needed to make a positive identification (5). The aim of individualization is to make sure that the victim can only match one individual. Then, a very important aspect is to test scientific standards based on a large sample (19,21). Tests as such can only come from case studies as presented in this paper. Identification of skeletal remains are complex and require careful assessment of both skeletal remains and personal belongings. If possible,

additional techniques should be incorporated in the final decision. As was done in this case, a DNA analysis added further assurance that the deceased person was John Doe. The investigation started with the initial observation about sex, age, race and stature, cause of death and time since death. These techniques seemed to have worked well in this case. It was confirmed that the remains belong to a white man, who was about 50 years and 167 cm tall. It was estimated that the time of death was at least, more than 10 years ago before the remains were exhumed, at the beginning of September 2016. Then, they were carried out to the Central Judicial Morgue to be analyzed. As we known later, the victim was murdered by his wife with a big knife that

damage his abdominal organs and caused his death suddenly. To obtain a positive identification, skull-photo comparison techniques were designed by the author.

The skull-photo comparison techniques as a method of identification has a long history (22). First, comparisons were made using only photographic equipment (23,25), later they were made by video superimposition techniques (26,31). But, now the use of a computer has a number of advantages as well, one of which is that the whole process can be accomplished by one person and there is also less equipment failure.(32,40). Digital video superimposition have proven to be very successful in the investigation of identities. This technique procedure has been a commonly used to assist in identification and has been accepted in courts around the world (41,57). With the availability of current technology, the whole process takes about one hour, and demonstrates effectively consistencies, between the skull and the facial photographs of the victim. However, success in identification depends upon the quality of the submitted photographs, as well as correct orientation and articulation of the skull and mandible. Although, the remains were identified by skull-photo comparison, another available evidence was also incorporated, as DNA analysis. In conclusion, this study shows that a positive identification can be made using traditional anthropological techniques and skull-photo comparison assisted by a computer. However, when it is possible, other complementary identification techniques can be used, as in this case DNA profiles comparison. It is, therefore, highly recommended that coroners and law enforcement agents obtain anthropological opinions when they are dealing with human skeletal remains of cold cases to analyzed and eventually identified them.

4. REFERENCES.

1. ISCAN, M.Y SOLLA, H.E. *Forensic anthropology in Latin America*. Forensic Sci. Int 2000; 109: 15-30.
2. SOLLA, H.E. *Study and Identification of Human Remains in Uruguay (1950-2001)*. The Forensic Examiner 2005; 14 (4): 20-5.
3. SOLLA, H.E. *Positive Identifications of Human Remains by Skull-Photo Comparison in Uruguay: A Review*. Rev Arg. de Anat. Clin 2015; 7 (1): 52-9.
4. SOLLA, H.E. *Identification and Reconstruction of Human Skeletal Remains in Uruguay*. The Forensic Examiner 2016; 1:1-8.
5. KROGMAN, W.M ISCAN, M.Y. *The Human Skeleton in Forensic Medicine*. 2nd Ed. Springfield, IL, Charles C Thomas, Publisher. 1986; pp.3-13.
6. BURNS, K. *Forensic Anthropology Training Manual*. New Jersey. Prentice Hall, Inc. 1999.
7. GILES, E. *Discriminant functions sexing of the human skeleton*. In: T.D. Stewart (Ed.), *Personal Identification in Mass Disasters*, National Museum of Natural History, Washington D.C, 1970; pp. 99-107
8. GILES, E ELLIOT, O. *Race identification from cranial measurements*. J Forensic Sci 1962; 7:147-157.
9. TROTTER, M. *Estimation of stature from intact limb bones*. In: T.D. Stewart (Ed.), *Personal Identification in Mass Disasters*, National Museum of Natural History, Washington DC, 1970; pp. 71-84.
10. ISCAN, M.Y LOTH, S.R. WRIGHT, R.K. *Age estimation from the rib by phase analysis: white males*. J Forensic Sci 1984; 29:1094-1104.
11. MEINDL, R.S. LOVEJOY, C.O. *Ectocraneal suture closure: A revised method for the determination of skeletal age at death and blind tests of its accuracy*. Am J Phys Anthropol 1985; 68:57-66.
12. SOLLA, H. E. *Un Nuevo Método para la Determinación de la Edad Anagráfica en Restos Oseos Humanos*. En: Revista Internacional de Biología de Poblaciones. Bogotá. 1994; 2 (2):1-13.
13. TODD, T. W. *Ages changes in the pubic bone "The male pubis"*. Am J. Phys Anthropol 1920; 3:285-334.
14. SOTO, H CASTELLANOS, R. TORIBIO, R. *Estudio métrico del canal medular del húmero como indicador de la edad*. En: Estudios de Antropología Biológica. México City, U.N.A.M. 1989 pp.143-8.
15. HENSSEGE, C. KNIGHT, B. KROMPECHER, T. MADEA, B. NOKES, T. *The Estimation of the Time Since Death in the Early Postmortem Period*. London. Edward Arnold, 1995.
16. EASTON, A.M SMITH, K.G. *The entomology of the cadaver*. Med. Sci Law 1970; 10:208-15.
17. RODRÍGUEZ, M. C. BASS, W. M. *Insects activity and its relationship to decay rates of human cadaver in East Tennessee*. J Forensic Sci 1983; 28: 423-32.
18. MORSE, D. *Studies on the deterioration of associated death scene materials*. In: D. Morse, J. Duncan, J. Stoutamire (Eds.), *Handbook of Forensic Archaeology and Anthropology*. Tallahassee, Bill's Book Store. 1983; pp.A1-A15.
19. ISCAN, M. Y. *Rise of forensic anthropology*. Yearbk. J Phys Anthropol 1988; 31:203-30.
20. ISCAN M. Y. *Forensic anthropology around the world*. Forensic Sci Int 1995; 74:1-3.
21. SOLLA, H. E. *Antropología Forense: Estudio de Casos 2*. Montevideo. Editorial Byblos, 2018.
22. GRÜNER, O. *Identification of skulls: a historical review and practical applications*. In: M Y Iscan, R. P. Helmer (Eds) Forensic

- Analysis of the Skull: Craniofacial Analysis, Reconstruction and Identification. New York, Wiley 1993; pp 29-45.
23. CHANDRA SEKHARAN, A. *Revised Superimposition Technique for Identification of the Individual from the Skull and Photograph*. J Criminal Law, Criminol Police Sci 1971; 62:107-13.
24. DORION, R.B.J. *Photographic superimpositions*. J Forensic Sci 1983; 28:724-34.
25. MCKENNA, J.J. JABLONSKI, N.G. FEARNHEAD, R.W. *A method of matching skulls with photographic portraits using landmarks and measurements of the dentition*. J Forensic Sci 1984; 29:787-97.
26. KOELMEYER, T.D. *Video- camera superimposition and facial reconstruction as an aid to identification*. Am. J Forensic Med Pathol 1982; 3:45-48.
27. HAGEMEIER, H. *Identification of a skull by electronic superimposition of images*. Criminal Police Rev 1983; 38:286-90.
28. BASTIAN, R.G. DALITZ, G D WOODWARD, C. *Video superimposition of skulls and photographic portraits. A new aid to identification*. J Forensic Sci 1986; 31:1214-21.
29. ITEN, P. X. *Identification of skulls by video superimposition*, J Forensic Sci 1987; 32:173-88.
30. CAI D, LAN Y. *A study on the standard for forensic anthropologic identification of skull image superimposition*. J Forensic Sci 1989; 34:1343-56.
31. HELMER, SCHIMMLER J.B. RIEGER J. *On the conclusiveness of skull identification via video superimposition technique*. Can Soc Forensic Sci J 1989; 22: 177-94.
32. PESCE DELFINO V, COLONNA M, VACCA E, POTENTE F, INTROINA F JR. *Computer-aided skull/face superimposition*. Am J Forensic Medicine and Pathology. 1986; 7:201-12.
33. NICKERSON B.A, FITZHORN P.A, KOCH S.K, CHARNEY M. *A methodology for near-optimal computational superimposition of two dimensional digital facial photographs and three-dimensional cranial surface meshes*. J Forensic Sci 1991; 36:480-500.
34. UBELAKER, D.H. *Computer assisted photographic superimposition*. J Forensic Sci 1992; 37:750-62.
35. BAJNOCZKY, I. KIRALYFALVI, L. *A new approach to computerized comparison of skull and photograph*. Int. J. Legal Med. 1995; 108:157-161.
36. ROSSI, M.L. *Techniques in facial identification: computer-aided facial reconstruction using a laser scanner and video superimposition*. Int. J. Legal Med. 1996; 108:194-200.
37. SMEETS, B DE VALCK, E. *L'utilisation de l'ordinateur en odontologie: superposition video et reproduction faciale par le biais d'une interface informatique*. Rev Belge Med Dent 1996; 51:272-83.
38. YOHINO M. H, MATSUDA S, KUBOTA K, IMAIZUMI S, MIYASAKA S, SETA, S. *Computer-assisted skull identification system using video superimposition*. Forensic Sci Int 1997; 90:231-44.
39. MARKS, M. K. et al. *Digital Video Image Capture in Establishing Positive Identification*. J Forensic Sci 1998; 42 (3): 492-495.
40. JAYAPRAKASH P.T, SRINIVASAN G, AMRAVANESWARAN M.G. *Cranio-facial morphanalysis: a new method for enhancing reliability while identifyng skulls by photo-superimposition*. Forensic Sci Int 2001; 117:121-43.
41. GLAISTER J, BRASH J C. *The Medico-Legal Aspects of the Buck Ruxton Case*. Edinburgh, E. and S. Livingston Eds. 1937.
42. BASAURI, C. *A body identified by forensic odontology and superimposed photographs*. Int Criminol Pol Rev; 1967a; 204: 37-43.
44. SIMPSON, K. *The Baptist church cellar murder*. Criminologist, 1970; 5: 93.
45. ECKERT, W.G TEIXEIRA, W.R. *The identification of Josef Mengele. A triumph of international cooperation*. Am. J. Forensic Med Pathol 1985; 6:188-91.
46. CURRAN, W.J. *The forensic investigation of the death of Josef Mengele*. Engl J Med 1986; 315:1071-73.
47. HELMER, R. *Identifizierung der Leichenuberreste des Josef Mengele*. Arch. Kriminol. 1986; 177:130-44.
48. HELMER, R. *Identification of the Cadaver Remains of Josef Mengele*. J Forensic Sci 1987; 32:1622-44.
49. SOTO, H BARCOS, C. *Identificación de las víctimas de un sicópata sexual en la República del Ecuador*. En: Estudios de Antropología Biológica. México City, UNAM. 1989; pp. 727-37.
50. IVANOV, L.P. ABRAMOV, S.S. *Authentication of the Skeletal Remains of the Last Russian Tsar and Royal Family. Cooperation Between Forensic Craneofacial Specialists and DNA Experts*. Paper presented at the 6th Annual Meeting of the International Association for Craniofacial Identification. I.A.C.I. Program. Edited by Mehmet Yasar Iscan, 1995; November 8-11, pp. 24-25.
51. UBELAKER, D. H. *The remains of Dr. Carl Austin Weiss: Anthropological Analysis*. J Forensic Sci 1996, 41(1):60-79.
52. SOLLA, HE ISCAN, MY. *Skeletal Remains of Dr. Eugenio Antonio Berríos Sagredo*. Forensic Sci Int 2001; 116 (2-3):201-11.
53. PATIÑO UMAÑA, A. *Utilidad y confiabilidad de la superposición fotográfica cráneo-rostro en la identificación de personas. Experiencia con casos desarrollados en el Instituto Nacional de Medicina Legal y Ciencias Forenses de Bogotá 1997-2002*. Revista del Instituto de Medicina Legal y Ciencias Forenses. Bogotá, 2004; 21-27.
54. SOLLA, H.E ISCAN, M.Y MCCABE, B. *A victim of a dictatorial regime: Identification of Mr. Roberto Gomensoro Josman*. Forensic Sci Int 2005; 151: 213-20.

55. HUMPIRE MOLINA, D. J. SOLLA, H.E. ZARATE RODRÍGUEZ, J.C. *Certeza de la identificación por medio de la superposición de imágenes cráneo-foto en la identificación de personas en la investigación criminal. Experiencia de casos desarrollados en el Instituto Nacional de Medicina Legal y Ciencias Forenses de Perú, Paraguay y Uruguay (2004-2009)*. Revista EUNOMIA, N°2, enero de 2010.
56. SOLLA, H.E ISCAN, M.Y MCCABE, B. 2010. *Skeletal remains of Ubagesner Chaves Sosa and Fernando Miranda Pérez: victims of a dictatorial regime in Uruguay*. The Forensic Examiner. 2010; 19 (2):28-39.
57. HUMPIRE D. J, SOTO B. *Análisis del Cráneo, Aproximación Facial en la Identificación por Superposición de Imágenes en la Criminalística*. Lima. Grupo Editorial Cromeo, 2013.
58. SOLLA, H.E ISCAN, M.Y MCCABE, B. *A rare case of identification and preservation of human remains*. Rev Arg de Anat Clin 2013; 5: 240-49.