

INSTRUMENTS FOR DIAGNOSTIC AND TREATMENT PURPOSES FROM THE LA TÈNE PERIOD IN CENTRAL EUROPE

INSTRUMENTY DO CELÓW DIAGNOSTYCZNO-LECZNICZYCH Z OKRESU LATEŃSKIEGO W EUROPIE ŚRODKOWEJ

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ABSTRACT: Sources of knowledge of treatment practices in the La Tène period in Central Europe are limited. Archaeologists very often classify findings on the basis of their personal opinions which are not substantiated by evidence. The theories that have been proposed so far are not widely accepted by the academics. Artefacts that are expected to be used for diagnostics and treatment are not usually chosen to deduce the form and processes of therapeutic practice in the La Tène period. The main issue of the topic is the possibility to distinguish between tools for therapeutic procedures and artefacts created for other purposes. However, there is also the question of whether it is possible to distinguish between tools originating from Central Europe and tools originating in the Roman or Greek environment, artefacts which originated in the studied period from medieval or modern objects, and the real artefacts, for which there are no suitable analogies, from counterfeits created in the 18th–19th centuries. For this purpose, specific debatable sets of artefacts are used. The goal of the research is to clarify the real purpose of the examined artefacts, for which it was previously proposed that they were used for therapy or diagnostics in the La Tène period. The results of the review and analysis of the artefacts have their explanatory ability about the state of practice in the studied geographical area.

KEYWORDS: Central Europe; Instruments; La Tène period; Tools; Treatment

The archaeology of medicine has developed very rapidly over the last 30 years, in many cases European universities have set up dedicated departments and have been systematically engaged in research involving modern scientific methods. There are

a number of artefacts interpreted as ‘medical tools’ or ‘surgical tools’ found on the territory of Central Europe. However, there were also numerous of disagreements and inconsistencies because the artefacts were interpreted on the basis of researchers’ personal assumptions. The field still has not been systematically grasped.

The aim of this paper is to present an outcome of review of previous interpretations of artefacts identified by different researchers as ‘medical/surgical tools/instruments’ of the La Tène period, from Central Europe. The presented artefacts are found in various contexts. Current efforts are to answer the main questions: Which of the artefacts found in the territory of Central Europe, that are presumed to have originate on the La Tène period, could have been used for diagnostic or therapeutic procedures? Further issues of the field are the possibility to recognise between tools from different territories and time periods and distinguishing between real artefacts and counterfeits. This includes, firstly, distinguishing the difference between artefacts from Central Europe and tools originating in Roman or Greek territories, secondly, distinguishing between artefacts from the studied periods and medieval or modern objects, and lastly, recognising between the real artefacts and counterfeits created in the 19th century and the beginning of 20th century. The artefacts interpreted as tools for therapeutic purposes can be found in the area of what is known today as Czech Republic, Slovakia, Germany (and Luxembourg), Poland, Austria, Hungary and Switzerland. The artefacts with utmost significance while comparing (local and Roman and Greek) tools, can be found in institutions in France, Italy, Spain and the United Kingdom.

The La Tène period seems to be of extreme importance for the development of the field of medicine and also a surgery (it is necessary to take into account the separate development of the two fields). On the basis of archaeological finds and Hippocratic works (which, despite the ambiguities regarding authorship, provide a significant amount of information to reconstruct the image of the field back then), researchers considered the times from the 5th to 4th century BC the moment when it is possible to recognize the unification of the subject of the field of medicine and the beginnings of methodological approach (Sakai, 2007). The period from the 5th century BC is thus the moment when the first metaparadigms of medicine were created in the ancient environment, it was a turbulent period that stood at the birth of medicine as a scientific field. Rome’s intensive contacts with Central Europe have led to the change of ancient knowledge into an environment where patient care lead in ways we are not aware of. In connection with the found tools for medical procedures, there are an enormous number of unanswered questions, and yet the archaeology of medicine still does not have a sufficiently strong background.

METHODS

The aim of this paper is to present outcomes of a critical examination of selected artefacts found in Central Europe, which could be used for medical and diagnostic purposes in the La Tène period. Those outcomes serve as a starting point for the next

phases of author's research – detailed analysis using archaeological and scientific methods (namely traceology and 3D modelling of selected artefacts). The goal of this research was achieved by compiling a catalogue of artefacts from the La Tène period, which were previously interpreted as 'medical instruments', 'medical tools', 'surgical instruments', or 'surgical tools' and are stored in institutions in selected states of Central Europe, or (in few cases) are held in private collections. In this paper outcomes of revision on the territory of the contemporary Czech Republic, Slovakia and the Lower Austria, North of the Danube are presented in more detail. The individual artefacts were further compared with analogous artefacts from European localities with known context and their original interpretation was critically evaluated. The methods of work are resource analysis and catalogue compilation, data analysis, material and comparative analysis.

TERMINOLOGY

Despite the fact that the Scottish physician and author of the first catalogue of antique instruments for treatment purposes J. S. Milne (1907) described the artefacts as 'surgical tools', terminology in the most of following archaeological publications of other authors is used very loosely. Various researchers started to use the term 'medical tools', in some sources, there is even the word 'doctoring' (Teall, 2014) used. Due to the separate development and different practices in surgery and medicine, and morphology of tools found so far, the term 'surgical' seems to be more appropriate for the majority of those artefacts. Specific issue is caused by the designation 'Celtic medicine' used for example by E. Künzl (1987; 1995) or V. Podborský (1994, p. 101, 116). First of all, there is no evidence that the therapeutic and diagnostic practices in the barbarian countries in the La Tène period were conducted in accordance with certain unifying ideas which we can call 'medicine' (as a science and an art), despite the fact that the first metaparadigms of medicine in the Greek environment have been detected. Secondly, Celtic ethnic group is associated with the barbarian countries in the La Tène period, but material culture cannot be primarily associated with ethnicity (Hubinger, 1988, p. 47). Lastly, it is questionable whether we can call all the La Tène period artefacts, allegedly produced locally, as 'Celtic'. Also, in most of the cases it is difficult to establish the place of production of the artefacts found in the territory of Central Europe in the La Tène period.

Field of archaeology of medicine also struggles with distinguishing between cosmetic tools as a part of everyday selfcare of an individual, and tools for treating and diagnosing other people with health issues. Cosmetic instruments do not demonstrate specialised activity, so their classification as surgical or mixing with surgical ones is not justified. K. Gostenčnik (2013, p. 95) explained the issue. She chose to classify the artefacts associated with organised healthcare activities (called primary), as opposed to artefacts used by the general public for personal hygiene (called secondary). In essence, it is possible to directly link primary instruments

with the activities of fixing health issues and secondary tools with cosmetic processes and everyday using. Based on this theory, scalpels, surgical knives, catheters, bone chisels, medical tweezers, cataract needles, lancets/ phlebotoms, special tools (craniotomy saws, etc.), dental and bone forceps and lithotomy instruments are considered to be tools primarily intended for treatment procedures. Secondary tools are spoons, spatulas and ear probes, balsamariums, medicine boxes and round metal containers, tweezers, friction plates (Gostenčnik, 2013, p. 95), but also e.g. toothpicks and strigils (Weller, Kaiser, Heynowski, 2016, p. 39, 45). E. Riha (1986) defined a medium category of tools that does not allow us to decide whether it is appropriate to consider the presence of specialised activities at the archaeological site or not. For example, spatulas could be used in both contexts, for personal hygiene and for treatment purposes.

MORPHOLOGY AND INTERPRETATION

Defining tool function often cannot be based just on a simple interpretation of morphology. It is necessary to examine the social value, role in the economy and technological processes connected to the tool. The circumstances of use vary based on the chronology, geography, availability of raw materials and cultural form of the user group. To answer the questions, it is usually necessary to examine a sufficient number of experimental samples, i.e. artefacts (Sáez, Lerma, 2015). It is necessary to approach artefacts that may have been used to diagnose or treat patients, and the place of their production is estimated in the barbarian territory, with a greater care in interpretation. There is no clear information from written sources about treatment practices in barbarian territory and it is not clear who used the tools and in what way. Pliny the Elder writes about the existence of druids as magicians and physicians (Pliny, NH, p. 30, 4; Bostock, Riley, 1855), the plants they grew (Pliny, NH, p. 16, 95; Bostock, Riley, 1855) and certain effects of the plant's usage (Pliny, NH, p. 24, 62; Bostock, Riley, 1855). Researchers often resort to deriving the situation in the La Tène period from the data about later periods. Archaeological finds, in the foreground with artefacts from Pompeii, the ancient Marcianopole in Bulgaria and Rimini, are therefore used to explain the everyday life of people providing the treatment services. More than 20 places were found in Pompeii where surgical or medical procedures were probably performed. The number and range of tools in the Casa del Medico Nuovo, for example, leads to the conclusion that it was a place of full practice for several surgeons (Bliquez, 2014, p. 12).

Tools for diagnosis and treatment found so far are usually not used by researchers to deduce further relationships of medical practices in the study area (Central Europe) and in the ancient environment, and the proposed theories are not widely accepted. So far, it has not been possible to clarify the real way of use of some artefacts for which the purpose in therapy or diagnosis has previously confirmed on the basis of written sources. For example, among the artefacts that have been examined so far, there are

significant questions concerning the use of saw-blade tools. In the context of the La Tène Period, small tools with an extended functional part are found, the edge of which is provided with small (originally probably sharp, today only corrugation is preserved due to iron oxidation processes) teeth, which are supposed to be used in cranial bone perforation (Härtl, 2005). These are finds, for example, from München-Obermenzing (Künzl, 1995).

For time being, tools are often analysed selectively and no comprehensive research was realised. The crucial issue is the differentiation of artefacts. Individual tools (in many cases also tool sets) can be easily confused with shoemakers' tools, punches, clothing and jewellery components, styluses, tools for surgery and/or horse hoof care, etc. Detection of counterfeits is crucial especially in the important and attractive localities. In the last three decades, interest in the knowledge of ancient surgery has increased considerably. The roots of enthusiasm for ancient surgical tools can be found in the 18th century, when surgical instruments were being discovered in Herculaneum (1738) and subsequently in Pompeii (1748; Bliquez, 2014) and the peak of interest is detectable at the beginning of 20th century. New archaeological finds and data from written sources served as patterns (Bliquez, 2014, p. 1), and until today counterfeits of surgical tools from localities such as Stradonice (CZ) might be used for profit.

PRODUCTION AND USE OF TOOLS FOR TREATMENT AND DIAGNOSTIC PROCEDURES FROM THE IRON AGE

Research on artefacts interpreted as surgical instruments found in Central Europe focuses mainly on structural typology (e.g., Milne, 1907; Jackson, 1995; Bliquez, 2014; Saber, 2010) and material analysis (e.g., Dungworth, 1997). Analyses of manufacturing techniques, traces of machining, and traces of use are still not numerous (Jakielski, Notis, 2000; Ménager, Tísoc, Cavallini, Conejo, Barboza, Salgado, 2021). For some artefacts, the way of use is only estimated (Gibbins, 1997). However, the identification of real purpose and production methods of instruments for medical procedures from the Iron Age can largely help in answering the fundamental questions of archaeology of medicine in barbarian Europe. Researchers have repeatedly confirmed that activities in human society meet certain standards, i.e. the artefacts are used or produced according to specific patterns that give them special properties (Ascher, 1961; Velázquez Castro, Melgar Tísoc, 2014). The tools found in Central Europe have not yet been subjected to a comprehensive survey, which would allow the identification of the usual methods of their production by identifying the production processes themselves and subsequent modifications.

The production and use of instruments for treatment purposes can vary considerably due to different influences, at different times, and in different geographical environments. It is influenced by the state of technical knowledge and skills of craftsmen, access to raw materials or different cultural nuances within each re-

searched environment (Sáez, Moro, 2020). Observations to date have shown that Roman surgical instruments have been cast into precision molds, and on the smooth surface it is possible to observe bubbles formed by the evolution of gases during the casting. The precision shaping of molds was preferred over the excessive shaping on a lathe (traces of rough turning of a larger piece of material on lathe are detectable microscopically and often even by unaided eye). This is related to the traditional method of production, where the handles were cast into molds, the blades were then forged, the lathes were used for threading for example on gynaecological mirrors (Bliquez, 2014, p. 18–19). Analyses conducted using the exact methods were performed only on selected artefacts. For example, K. E. Jakielski and M. R. Notis (2000) analysed microstructure of the material of several imported spatulas. They detected very fine smoothing at the working part of the two-part spatula from the 1st–4th century AD. However, the authors found on the free end of the working part of the spatula that it was cast into mold, hammered, annealed and then mechanically deformed in the last step of production (Jakielski, Notis, 2000). However, cold gripping and annealing were recorded on the gripping part of this copper spatula with tin admixture (Jakielski, Notis, 2000). It is undeniable that obtaining similar information about each artefact (or at least a significant sample of artefacts) would be useful to reveal a broader picture of the field. Microscopic techniques are very suitable for the analysis of metal artefacts, as the investigation of microstructural properties can provide relevant information on production techniques, but also on corrosion and degradation processes, without the need for sampling and thus without destruction of the artefact (Figueiredo, Silva, Araújo, Fernandes, 2013).

LA TÈNE PERIOD TOOLS IN CENTRAL EUROPE

The picture of surgical practices in the La Tène period cannot be constructed solely based on the found tools, but some information can be provided by analyses of spatulas, phlebotoms, forceps, scalpels, knives, tweezers and saws.

Hellenistic type probes with a concave recessed spatula and some with small ‘wings’ (for example from Magdalensberg in Austria), occur relatively often in the environment of La Tène oppida (Gostenčnik, 2002, p. 168). A very flat shaft can be observed on artefacts from La Tène settlements, such as Jüchsen in Germany Thuringia (Grasselt, 1994; Künzl, 1995, fig. 8), Basel-Gasfabrik in Switzerland (Künzl, 1995, fig. 7), Oberleiserberg in Austria (Kern, 1996, abb. 8) and Stradonice in Czech Republic (Píč, 1903, tab. 24: 9, 10, 11). Spatulas on Celtic oppida are probably imported (Gostenčnik, 2002, p. 168). However, the finding of the spatula itself does not prove the presence of a specialised treatment, because it could be used as a cosmetic tool (Gostenčnik, 2013, p. 95).

The lancet, or phlebotome, often occurs in texts about bloodletting. This is a rare finding among the artefacts, in practice it could be replaced by a common scalpel (Bliquez, 2014, p. 7). Phlebotomy is a surgical cross-section of a vein (Kábrt, Kábrt,

2004, p. 733). Phlebotome interpreted by J. L. Pič among the finds from Stradonice, Czech Republic (Pič, 1903, p. 69) has a very strong features. The shape of the instrument meets the needs of the phlebotome, the sharp but soon-widening tip allows the tissues to be perforated without the hole healing too quickly.

Tweezers and forceps are among the relatively abundant artefacts. Tweezers and forceps in the context of Central Europe are usually compared with younger tweezers and forceps from the sets of surgical instruments from Italian Pompeii (Gostenčnik, 2004, abb. 10: 2) and with artefacts stored in the museums in Mainz in Germany (Gostenčnik, 2004, abb. 10: 3) and Athens in Greece (Bliquez, 2014, fig. 33). Researchers classify tweezers as secondary instruments (Gostenčnik, 2013, p. 95), L. J. Bliquez (2014, p. 4) concluded that it is not appropriate to freely mix objects of daily use with surgical tools, unless the context is known. Scalpels are among the most commonly found surgical instruments. Almost every set of surgical instruments found to date contains at least one piece. Blades are not always preserved, but examples of scalpels with different shapes and sizes of blades are known (Gostenčnik, 2013, p. 96). Categorization into knives and scalpels in archaeologists' catalogues is not uniform. In today's instrumentarium, the name 'knife' could be found, for example, amputation knife or a transplant knife. In practice, the name is reserved for tools with a long blade. The length of the blade is usually not reflected while labelling the tools in artefact catalogues, and researchers assign tools at their own discretion. Scalpels can be mistaken for razors and it is therefore not appropriate to base the interpretation only on the 'shape uniqueness' of the instrument.

In the context of the La Tène period, small tools with an extended functional part are found, the edge of which is provided with small (originally probably sharp, today only corrugation) teeth. The saw-blade is usually not preserved well due to iron oxidation processes. The tools are expected to be used in cranial bone perforation, but due to problems with identification of the teeth on the edge, they may not be interpreted correctly.

Some tools pose a specific problem. J. P. Guillaumet (2016) compiled a catalogue of sets that could be used to treat horses, especially their hooves. Many of these sets have been interpreted by previous researchers as sets of surgical tools. This interpretation comes into question also in the case of a set of iron tools found without any context by metal-detecting (practiced by member of public) in Slatina nad Bebravou (Slovakia) in 2008. K. Pieta (2008) subsequently interpreted these artefacts as a set of tools intended for surgical purposes (Pieta, 2008, p. 112). The artefacts from Slatina nad Bebravou (fig. 1) have mandrels designed to be placed on a handle made of easily degrading material in the same shape and length with tools known from other sets found in Europe, and also the transitions to the working parts of the tools are provided with a decorative extensions. Working parts of the tools could be used in both considered contexts. A review of the tool interpreted as a trepanation saw (fig. 1: f1, f2), would shed light on the problem. Unfortunately, the tool has not been preserved. Chisels cannot be described as tools for medical procedures without other artefacts supporting this hypothesis.

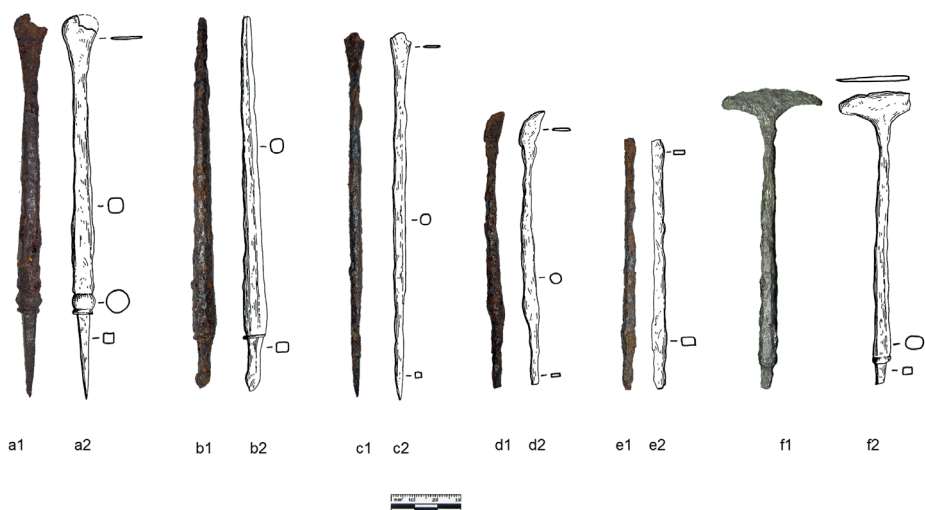


Fig. 1. Collection of artefacts from Slatina nad Bebravou. Figures (a2, b2, c2, d2, e2, f2) made by Karol Pieta, photographs a1, b1, c1, d1, e1 made by author, with consent of K. Pieta, figure f1 made by K. Pieta (2008, F 24)

Chisels can be used for woodworking, as diggers and in other contexts. According to G. Jacobi (1974, p. 35–36), iron chisels are one of the most common craft tools found on oppida and have been used (although they may have been used in surgical interventions or blacksmithing) especially in carving.

REVISION OF EARLIER INTERPRETED ARTEFACTS OF IRON AGE IN SELECTED AREA

On the territory of contemporary Czech Republic, Slovakia and the Lower Austria, north of the Danube a total of 14 items (at 7 localities) originating in the Hallstatt and La Tène period, interpreted as ‘medical/surgical tool/ instruments’ were analysed, 7 of which (at 4 locations) could have been used for therapeutic procedures (fig. 2).

Spatulas (probably imported) found in Stradonice (Píč, 1903, p. 69, tab. 24: 9, 10, 11) could theoretically be used for treatment, as there are other artefacts on the site that could have been used for treatment purposes. Phlebotome (Píč, 1903, p. 69, tab. 24: 12) represent the primary instrument in this locality. Spatula was also identified in Oberleiserberg (Kern, 1996, p. 388, abb. 8). The set of artefacts from Slatina nad Bebravou (Pieta, 2008, p. 112, 203, F 24) could have been used for surgical purposes but requires further analyses to prove this presumption. An artefact originating in the Hallstatt period from Adamov, Býčí skála (Bull Cave) in Czech Republic (Parzinger,

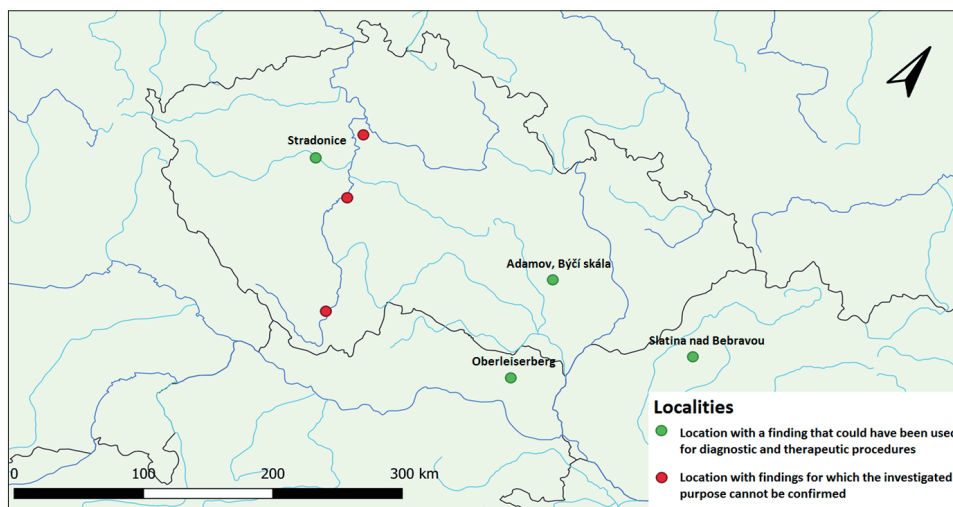


Fig. 2. Locations with artefacts from the Iron Age, which were interpreted as surgical instruments and stored in institutions in the Czech Republic, Slovak Republic and the Lower Austria – North of the Danube

Nekvasil, Barth, 1995, obr. 426) is interpreted as a saw for craniotomies. According to the analogies and the described context, it is possible that the instrument actually served its presumed purpose.

CONCLUSIONS

The main issues connected to the surgical tools found in the environment of Central Europe is to distinguish imported artefacts from locally produced tools, differentiation of surgical tools from shoemakers' tools, punches, clothing and jewellery components, horse hoof care sets of tools, etc. For most of the artefacts, it is not possible to determine the place of manufacture. Interpretation of findings on the basis of personal opinions not substantiated by evidence leads to a severe disruption of the real image of the field at the time under the study. To date, tools are analysed selectively, no comprehensive research has been completed. There is no uniformity for assessing the morphology, structure, decorations and there is not enough detailed data about individual artefacts. The uncertainty in interpretation of surgical tools prevents us from defining the real picture of the field in Central Europe and therefore it is necessary to employ the systematic methodological approach.

Activities in human society meet certain standards, artefacts are used or produced according to specific patterns that give them specific properties. The production method is influenced by the state of technical knowledge and skills, access to raw materials, or different cultural nuances (Sáez, Moro, 2020, p. 173). Analyses performed on individual selected subjects can shed light on the interpretation of artefacts, perform-

ing tests and measurements on a large set and range of subjects can explain the usual production principles and contribute to the study of relationships between ancient cultures and cultures in Central Europe.

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INSTRUMENTY DO CELÓW DIAGNOSTYCZNO-LECZNICZYCH Z OKRESU LATEŃSKIEGO W EUROPIE ŚRODKOWEJ

Streszczenie

Informacje dotyczące praktyk leczniczych w Europie Środkowej okresu lateńskiego są znikome. Archeolodzy nierzadko klasyfikują powiązane z nimi znaleziska na podstawie własnych, nieopartych materiałem źródłowym opinii, a teorie, jakie zostały do tej pory sformułowane, także nie są ogólnie przyjmowane przez środowiska akademickie. Odkrywane przedmioty, które – jak się przyjmuje – użytkowano w celach diagnostycznych i leczniczych, zazwyczaj nie są badane pod kątem kształtu i sposobu przeprowadzania praktyk terapeutycznych w okresie lateńskim.

Celem niniejszego artykułu jest przedstawienie wyników analizy wybranych przedmiotów odkrytych na obszarze Europy Środkowej, co do których istnieje podejrzenie, że mogły być wykorzystywane w okresie lateńskim do celów medycznych i diagnostycznych. Głównym problemem pojawiającym się w przypadku podejmowanej tematyki jest kwestia samej możliwości odróżnienia przyrządów używanych do leczenia od tych stosowanych w innych celach. Co więcej, powstają także pytania, na ile możliwe jest odróżnienie przedmiotów o proveniencji środkowoeuropejskiej od rzymskich i greckich, lateńskich od średniowiecznych lub nowożytnych, a wreszcie oryginalnych od osiemnasto- i dziewiętnastowiecznych kopii.

W przypadku większości niemożliwe jest ustalenie miejsca ich pochodzenia. Interpretacja znalezisk na podstawie własnych opinii, bez podbudowy źródłowej, prowadzi z kolei do znac-

nego wypaczenia rzeczywistego obrazu podejmowanej problematyki. Przedmioty analizowane są wybiórczo, jednostronnie. Nie ma ujednoczonego sposobu opisu ich morfologii, struktury, ornamentyki; nie ma także wystarczająco szczegółowych informacji o poszczególnych pojedynczych artefaktach. Niepewność interpretacyjna w stosunku do instrumentów chirurgicznych praktycznie przekreśla możliwość zdefiniowania realnego obrazu tej dyscypliny w Europie Środkowej – przekłada się to na potrzebę wypracowania i wdrożenia odpowiedniego usystematyzowanego metodologicznego podejścia.