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**Tracing Horton's disease in Renaissance artworks: the first International Society of Iconodiagnosis systematic iconodiagnosis cases review on a specific disease**

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**Key words:** Horton's disease, temporal arteritis, giant-cell arteritis, iconodiagnosis, art.

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## **Abstract**

Iconodiagnosis is the medical analysis of pathological signs depicted in historical artworks. As part of the activities of the International Society of Iconodiagnosis (ISI), we are initiating a series of systematic reviews organized by type of iconodiagnosis. These efforts aim to support the compilation of data to enable semi-quantitative analysis. We begin this series with artworks that depict visual signs suggestive of temporal arteritis, also known as Horton's disease, already published in scientific literature indexed in PubMed, as a first phase.

In accordance with PRISMA 2020 guidelines, we developed a systematic review protocol, including predefined eligibility criteria and a structured data extraction strategy.

We report 8 historical artworks from the Renaissance period, each depicting visual clinical features - primarily dilation and tortuosity of the superficial temporal arteries - consistent with temporal arteritis. These include works by Italian painters such as Filippino Lippi and Piero di Cosimo, as well as Flemish artists like Jan van Eyck, among others, currently housed in museums across Europe and the United States.

Two cases are supported by historical documentation regarding the identity and medical history of the individuals portrayed, confirming the iconodiagnosis. This highlights the importance of interdisciplinary collaboration between physicians and art historians.

The convergence of artistic realism and anatomical precision in these Renaissance artworks has transformed them into valuable sources for

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semiological and epidemiological study. In a second phase, this review will be expanded to include additional cases reported in books and non-indexed sources.

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## **Introduction**

Iconodiagnosis involves identifying suggestive clinical signs of medical conditions in artistic representations. This approach, at the intersection of art history and medicine, is based on careful observation of morphological details of the artworks. In 2023, the International Society of Iconodiagnosis (ISI) was established to formalize this emerging discipline.<sup>1</sup> In the context of ISI's research programs, the ISI members initiate a systematic series of reviews dedicated to individual iconodiagnosis conditions. This article represents the first contribution in that series, dedicated to temporal arteritis.

Temporal arteritis, also known as Horton's disease (named after Bayard Taylor Horton, 1895-1980), or giant-cell arteritis, is a systemic immune-mediated vasculitis affecting medium-sized to large-sized arteries with a preference for cranial vessels - particularly the temporal branch of the carotid artery. Its main signs and symptoms include headache, tongue numbness, myalgia, fever, and anorexia/weight loss. Among its most severe complications are visual loss, potentially leading to blindness, and its association with polymyalgia rheumatica, occurring in a significant percentage of cases.<sup>2</sup> Recent epidemiological studies estimate that temporal arteritis affects approximately 15 to 25 per 100,000 people over the age of 50 each year in Western countries, with incidence increasing with age and female predominance.<sup>3</sup> These figures underscore the relevance of identifying potential historical depictions of this disease in Renaissance art, offering valuable insights into the historical epidemiology of temporal arteritis.

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## **Materials and Methods**

A literature search was conducted using the PubMed database to identify articles addressing the representation of Horton's disease in the arts. The search strategy included the keywords “Horton disease,” “temporal arteritis,” and “art,” “iconodiagnosis”, “painting”. Only articles indexed in PubMed were considered for this initial step; books and other non-indexed sources were not included. The selection and analysis of the articles followed the PRISMA 2020 (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines.

This systematic review protocol is structured with the following items: i) eligibility criteria (inclusion: artworks from 15<sup>th</sup> to 16<sup>th</sup> century that depict human subjects with visible signs compatible with temporal arteritis, e.g., temporal vessel dilation, asymmetry, turgidity); ii), the PubMed database as source; iii) search terms will include “Horton’s disease”, “temporal arteritis”, “art”, “portrait”, “iconodiagnosis”, “painting” and combinations using boolean operators; iv) data collection and extraction (for each artwork: artist, title, date, medium, location, subject identification, clinical signs visible), and v) risk of bias assessment (respect of the iconodiagnosis guidelines,<sup>4</sup> cross-examination with existing historical biographical data). All the collected references were centralized in the ISI Library using the Zotero reference management software.

## **Case Reports**

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Eight cases related to the iconodiagnosis of Horton's disease, selected based on publications in peer-reviewed journals from PubMed, are summarized in Figure 1 and Table 1. All cases involve male subjects. All subjects are depicted in profile view, except for the statue, which allows examination of both temporal regions. Among these eight cases, four display clinical signs on the right side, three on the left, and one (Michelangelo) alternates between the right and left sides. This distribution likely reflects not only the natural variability of the disease (unilateral or bilateral) but also the prevailing artistic conventions of the time - such as the frequent use of profile portraits.<sup>5-12</sup>

## **Discussion**

The preliminary findings validate the feasibility of a systematic approach to iconodiagnosis following PRISMA standards using the PubMed database. The observed concentration of cases during the Renaissance period aligns with that era's emphasis on anatomical realism in art.

The analysis of Jan van Eyck's "Virgin and the child with canon van der Paele" (artwork A) has been proposed as one of the earliest visual representations of temporal arteritis in Renaissance art and documentary evidence was found in literary sources to support the iconodiagnosis.<sup>10</sup>

The case of Michelangelo is that identified signs of Horton's disease through examination of two portraits and a bronze sculpture from Daniele da Volterra (artworks F, G, H)<sup>11</sup> suggests these features correlate with symptoms reported at the end of Michelangelo's life, such as blindness and depression.<sup>12</sup> Moreover, Galassi *et al.*<sup>9</sup> highlight a clear connection between two paintings in which the woodcarver Francesco Giamberti serves as

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the common model. He was depicted by two different artists, both showing visible signs of temporal arteritis. Notably, Piero di Cosimo painted his portrait (artwork D) posthumously, while Filippo Lippi's Saint Frediano (artwork C) bears a striking resemblance to him.<sup>8</sup> This observation further strengthens the validity of iconodiagnosis.

The semi-quantitative analysis highlights i) Italian and Flemish dominance - the majority of cases involve artists from the Italian Renaissance or the Flemish school, confirming the prevalence of realism in art and the emphasis on detailed anatomical observation during this period; ii) variety of artistic media, despite variations in technique - tempera, oil painting, and bronze sculpture - the visual signs of vascular pathology are equally legible, highlighting the cross-medium reliability of iconodiagnosis when realism is present and iii) support from literature – two cases demonstrate that iconodiagnosis can transcend speculation when supported by corroborative historical and medical evidence. This strengthens the credibility of visual diagnostics supported by historical analysis emphasizing underlining the need of transdisciplinarity.

## **Conclusions**

This protocol forms the foundation for a comprehensive systematic review of diseases represented in art. The next steps involve conducting an exhaustive literature search and extracting data from books, as well as launching an international call to museums inviting curators to reexamine their collections through an iconodiagnostic perspective. Curators will be asked to identify and report any visible anomalies in the temples of

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subjects depicted in artworks, thereby enabling ISI physicians to perform subsequent iconodiagnosis. This initiative aims to create a more comprehensive and collaborative iconodiagnostic atlas of diseases represented throughout art history. Meanwhile, international ISI members are encouraged to actively support this effort within their respective national museums.

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**Figure 1.** An iconodiagnostic study of potential cases of Horton's disease depicted in Renaissance artworks.

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**Table 1.** Summary table of iconodiagnosis cases relative to Horton's disease in Renaissance visual artworks.

	Artist	Nationality	Title of the artwork	Type and date of the artwork	Museum	Country	Signs of temporal arteritis	Information on the subject's state of health	Reference in PubMed
A	Jan van Eyck	Flemish	<i>The Virgin and Child with Canon van der Paele</i>	Oil on oak panel 1434-1436	Groeningemuseum, Bruges	Belgium	Dilated tortuous vessel on left temple	Yes	5;10
B	Jan van Eyck	Flemish	<i>Portraits of Joos Vijd and Elisabeth Borluut (donators of the Ghent Altarpiece)</i>	Oil on panel 1432	St. Bavo's Cathedral, Ghent	Belgium	Dilated tortuous vessel on right temple	No	6
C	Filippino Lippi	Italian	<i>Saints Paul and Frediano</i>	Tempera glazed with oil on panel 1483	Norton Simon Museum	USA	Dilated tortuous vessel on left temple	No	7
D	Piero di Cosimo	Italian	<i>Portrait of Francesco Giamberti</i>	Oil on panel 1482-1485	Rijksmuseum	Netherlands	Dilated tortuous vessel on left temple	No	8
E	Andrea Mantegna	Italian	<i>Profilo d'uomo</i>	Tempera glazed with oil on wood 1460-1462	Poldi Pezzoli Museum, Milan	Italy	Dilated tortuous vessel on left temple	No	9
F	Daniele da Volterra	Italian	<i>Statue of Michelangelo</i>	Bronze statue 1564	Galleria dell'Accademia, Florence	Italy	Dilated tortuous vessel on left temple	Yes	11,12
G	Jacopino del Conte	Italian	<i>Portrait of Michelangelo</i>	Oil on panel Circa 1535	Metropolitan Museum of Art, New York	USA	Dilated vessel on right temple	Yes	11,12
HI	Marcello Venusti	Italian	<i>Portrait of Michelangelo</i>	Oil on panel Circa 1550	Casa Buonarroti, Florence	Italy	Dilated tortuous vessel on right temple	Yes	11,12
I	Urs Graf	Swiss	<i>Bust of a Bearded Old Man</i>	Pen and black ink 1521	Metropolitan Museum of Art, New York	USA	Dilated tortuous vessel on right temple	No	13
J	Jacopo Bassano	Italian	<i>Portrait of a Man</i>	Oil on panel Circa 1576	Museum of Fine Art, Boston	USA	Dilated tortuous vessel on right temple	No	13

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