

## Thyroid diseases in the Byzantine era

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References to goitre are found in texts several thousands of years old, as mentioned by Langer<sup>1</sup>. This is recognized in several textbooks, but there is usually an apparent time gap until the modern era, and the important contribution of Byzantine medical authors to this subject is singularly ignored<sup>2</sup>. In a previous paper we have drawn attention to the first description of exophthalmic goitre in a 6th century byzantine *legal text*<sup>3</sup>. This latin text of *Digesta of Corpus Juris Civilis Justiniani*<sup>4</sup>, on which the subsequent Greek text of *Vasilica*<sup>5</sup> is based, states 'quis natura gutturosus sit aut oculos eminentes habeat'. But the first writer of this text, according to J. Zepos (1910-1911), is the jurist Dometius Ulpianus (170-228 AD). This description of exophthalmos in association with goitre took thus place about 1000 years earlier than the account by a 12th century Percian physician<sup>2</sup>.

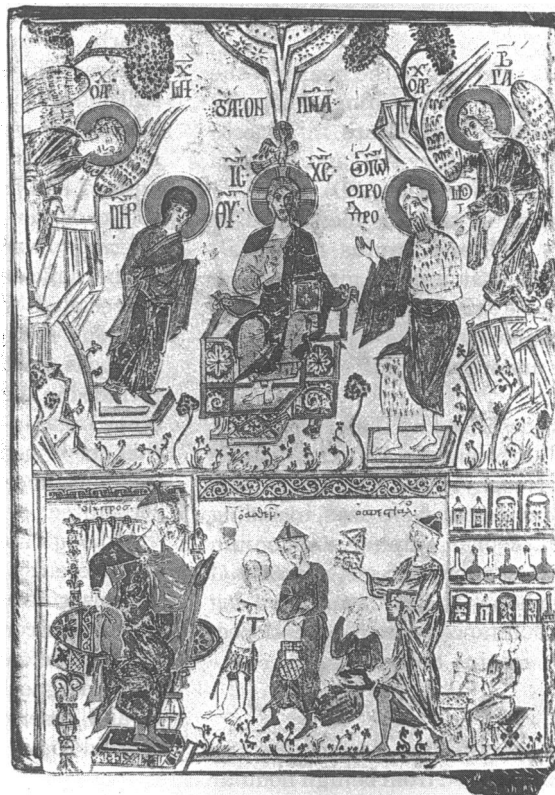
In the present article we extend these observations and show that the Byzantine physicians had an interest in and some knowledge of the thyroid gland and its diseases.

### Goitre

Enlargement of the thyroid gland (goitre) has attracted the attention of mankind since the dawns of civilization<sup>1</sup>. It was known to Hippocrates who lived in the 5th century BC<sup>6</sup>. The 1st century AD, during the



*Pedanius Dioscorides, prominent Greek physician, who lived the first century AD, in the eastern part of the Roman empire, which became later the Byzantine empire. Ekdotike Athenon, 1985*



*Figure 2. The frontispiece of the Manuscript "Μέγα Δυναμείον", ie a kind of Textbook of Pharmacology, by Nicholas Myrepsos (in Greek Μυρεψός). A physician, probably Myrepsos himself, is shown in the left, attending patients. Jesus Christ, the Virgin Mary, the Holy Spirit, St John Prodromos and the Archangels Michael and Gabriel are shown above. From MS No 2243. National Library of Paris, 1339*

Roman era, Dioscorides<sup>7</sup> (Figure 1) first used the term 'bronchocele', literally meaning 'hernia of a bronchus', a term which still is the standard greek term for goitre. Galenus, in the 2nd century AD also used this term<sup>8</sup>. The concept that a goitre is a hernia of the larynx was not confined to these authors. The English term 'goitre' had probably a similar origin, since 'guttur' in latin means the larynx or bronchus.

With this background in mind, it is not surprising that goitre is referred to by several Byzantine authors. Aetius<sup>9,10</sup> in the 6th century refers to it as a swelling round the bronchus, and also 'bronchocele, id est gutturis ramex appellatus tumor in gutture', that is 'bronchocele, or hernia of a bronchus, is called a tumour of the bronchus', or the neck, since larynx, bronchus and neck were frequently referred collectively as one structure. Similar definitions were given by Paulus Aegineta<sup>11</sup> (7th century AD), Neophytus Prodromenus<sup>12</sup> (14th century AD), Michael Psellus<sup>13</sup> (11th century AD) and others.

Paulus Aegineta<sup>14</sup> (7th century AD) recognizes two types of goitre, the 'στεατώδεις' (steatomatous), ie greasy, probably referring to the colloid ones, and 'εύρυσματώδεις', probably referring to the hyperplastic and hyperaemic ones. 'Atheromatous' goitres, probably colloid and cystic, are mentioned by Aetius<sup>10</sup> (6th century AD), Theophanes Nonus<sup>15</sup> (10th century AD) and Nicolaus Myrepsus<sup>16</sup> (13th century AD) (Figure 2). These descriptions fit with the concept that the goitres which had attracted the attention of the byzantine physicians were non-toxic, with colloid degeneration and cyst formation, probably the result of long-standing iodine deficiency, which still plagues most developing countries.

Byzantine legal texts referring to the health of the persons with the purpose of defining disability frequently refer to goitre. This occurs in Digesta Corpus Juris Civilis<sup>4</sup> (6th century AD) and Vasilica of Leon 6th the Wise<sup>5</sup> (10th century AD).

The surgical treatment of goitre is mentioned by Aetius<sup>10</sup> (6th century AD) and Paulus Aegineta<sup>11</sup> (7th century AD). This last author gives several technical details, but he is (wisely) conservative in his general approach, emphasizing the dangers of the surgical intervention under the primitive conditions prevailing then.

Medical treatment is described by Dioscorides<sup>17</sup> (1st century AD), Aetius<sup>18</sup> (6th century AD), Orevasius<sup>19</sup> (4th century AD) and Neophytus Prodromenus<sup>12</sup> (4th century AD). Several substances were used, including chemicals like calcium, copper, sulphur, ammonium salts and various powders, plant extracts, and animal products ranging from honey to lizards and even dog excrement. Iodine-rich substances were not mentioned, except for shells from marine organisms.

### Thyroid cancer

Without pathological examination, carcinomas can not be accurately differentiated from benign nodular goitre. Nevertheless, especially hard thyroid enlargements are described by Aetius<sup>10</sup> and Philagrius (4th century AD) and Orevasius (4th century AD). Aetius<sup>10</sup> (6th century AD) states 'the malignant tumour is incurable'. Orevasius<sup>20</sup> (4th century AD) also mentions 'carcinomas of the neck' probably malignant thyroid tumours. Various remedies advised by Orevasius<sup>20</sup> (4th century AD) and Dioscorides<sup>17</sup> (1st century AD) can not be separated from those recommended for benign goitres.

### Exophthalmos

Exophthalmos probably due to Graves' disease is frequently mentioned in the byzantine literature. The first association between exophthalmos and goitre is found in a legal text of the 6th century, which states that patients with this syndrome are fit for work<sup>3</sup>. As stated in the introduction, the latin text of Digesta Corpus Juris Civilis<sup>4</sup> is probably based on the legal work of Dometius Ulpianus, who lived from 170 to 228 AD (ed. 1910-1911).

Exophthalmos is described by Meletius monachus iatrosophista<sup>21</sup> (8th century AD), Romanus<sup>22</sup> (10th century AD) and Joannes Actuarius<sup>23</sup> (14th century AD). That this is the exophthalmos of Graves' disease rather than another entity is suggested by its association with nervousness and changes in the mood. Meletius<sup>21</sup> (8th century AD) writes 'οι όφθαλμοί . . . προς τά έκτός έξώγκωνται και έξάλλεσθαι θέλουσιν . . .

τους διακειμένους προς τά έκτός άβεβαίους και θυμικούς . . . ώνόμασαν', ie 'The eyes tend to swell and jump out . . . make the person uncertain and nervous'.

### Discussion

It is generally accepted that the study of Byzantine medicine is limited and superficial. Many authors either had no access to the original manuscripts or were not medically qualified.

The fact that it has not attracted sufficient interest does not mean that Byzantine medical literature is poor or nonexistent, as shown here for the thyroid gland. It may be seen that Byzantine physicians were clearly aware of goitre and the various thyroid diseases. This should be of no surprise, since goitre is still endemic in what are now Greece and Turkey, and which then were the centre of the Byzantine empire. It was endemic nontoxic goitre that the Byzantine authors had mostly in mind, and to the treatment of this condition that the host of remedies previously referred to were destined. Nevertheless, the impact of iodine deficiency on endemic goitre had not been appreciated. We could not find any reference of goitre in people living away from the sea or not consuming sea foods. Furthermore, although marine shells were included in the treatment of goitre, there are so many other organic and inorganic substances mentioned, that one is justified in concluding that the role of some 'sea substance', eg iodine, had not been specifically recognized.

Although nontoxic goitre attracted more attention, the references to exophthalmos and to hard 'carcinomatous' goitres show clearly that Graves' disease and thyroid cancer had not been neglected.

It is therefore obvious that the Byzantine physicians, far from ignoring thyroid disease, were well aware of it and deserve a definite place in the history of thyroidology.

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